

# FLIGHT

First Aero Weekly in the World.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM.

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## Flight.

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## EDITORIAL COMMENT.

### The Progress of Flight in 1912.

Year by year the task of reviewing the progress of aviation becomes more and more difficult, not from want of the necessary material to make a story, but because there is so much doing that the sifting process becomes so intensely difficult that the historian is almost tempted to give up his work in sheer despair of his ability to preserve the due proportion of things. Matters that a year ago would have been regarded as of primary importance have, by the end of December, dropped to the level of the common-place. A very little time ago a hundred miles' cross-country flight would have deserved a special paragraph all to itself in such a review as we are accustomed to give of the doings of the year. Now the mention of one of three times that distance would almost cause the critical to raise their eyebrows in astonishment that we should think it of any importance. Naturally this is all to the good of the movement, inasmuch as it predicates extraordinary progress in design and accomplishment, and we trust that for many years to come we may be able to sit down to our self-imposed task with this same sense of the impossibility of doing adequate justice to the progress of the year.

Taken all round, the year 1912 has been a notable one in the aviation world, and much progress has been made

in every direction, and it may be said, without fear of contradiction, that constructionally the aeroplane has made enormous advances. That is fully indicated by the records of flight achieved, not only in respect of duration records, but of useful work accomplished through the medium of the aeroplane and the dirigible, all of which will fall to be noted later on.

Once again we find our task tinged with sadness, for although we, in common with all connected with or interested in the great aviation movement, must realise that for years to come the air must take its toll of human victims, and though we know that those who have sacrificed themselves on what they conceive to be the altar of duty, we should be something less than human did we not feel a sense of personal loss when we cast back over the history of the year and think of those who have gone from among us. And 1912 has been singularly unkind to the British section of the movement. It is true that we have not been called upon to pay the heavy price that has been exacted from our friends on the other side of the Channel, but nevertheless, our death roll has been a heavy enough one, and accident has removed some of our most brilliant flyers—but it must be that we pay the price of progress, and we have at least this consolation that those who have paid it, even at the cost of life, would not have us mourn unduly for them.

During the year many notable things have happened with regard to military aviation, both at home and abroad. Unfortunately, it has to be recorded that even now we do not in this country appear to recognise the essential need that is upon us to put our aerial house in order lest untoward things should happen to us. Much good missionary work has been done, and in this connection we should be doing less than justice did we not refer in passing to the public spirit manifested by Lord Northcliffe and his colleagues of the *Daily Mail*, who have devoted much money and energy to the endeavour to bring home to the nation the need for an adequate aerial fleet. The thanks of the whole community in general and of those more intimately identified with the movement in particular are due to them for their efforts.

### The Year in Detail.

Taking the year month by month, as has been our custom of old, January was an exceedingly quiet month. Bad weather prevailed during the whole month and consequently no notable flights or achievements were chronicled either at home or abroad. During February,

things moved rather more, and at home Lieut. Barrington-Kennett flew 249 miles with a passenger, this being a world's record at the time. Unfortunately, the first British fatality of the year was recorded, Mr. Graham Gilmour being killed through the collapse of his machine while flying near Richmond. Considerable interest was aroused by the inclusion in the draft of the Army Estimates, issued during the month, of an appropriation of £308,000 for the aerial services, though there was a good deal of criticism directed at the details of the proposed scheme. In France, the military estimates were put before Parliament and disclosed the fact that no less a sum than £880,000 was to be spent before the end of the year on aircraft, the plans providing for the construction of 15 dirigibles and the raising of the number of aeroplanes to be available by the end of the financial year to 344. Since then, other votes have been taken and the French expenditure has not been far short of a million sterling.

In March the Government announced that it was intended to form a new flying corps, embracing members of both services and also civilian airmen who would be given military rank. This proposal has since resulted in the formation of the Royal Flying Corps as it exists now. In view of the comparative smallness of the sum to be devoted to military aviation under the Army Estimates, the hope had been expressed that a further sum would be asked for the service of the Navy when the Naval Estimates came before Parliament, but on their introduction it was found that this was not to be the case, and considerable disappointment was expressed by those whose view it was—and is—that this country should be at least as strong in the air as any of its possible enemies. Some notable flights were accomplished during the month. Salmel set up a new record in the attempt to fly from Hendon to Paris and back, in which he succeeded in reaching the French capital in record time and in ultimately flying back to Beckton, where he damaged his machine so badly in landing that he was not able to continue. Tabuteau flew from Pau to Paris in a single day, while Vadrines made himself famous by conducting an electioneering campaign by aeroplane when standing as a candidate for the French Chamber of Deputies—unsuccessfully, it may be noted. In France, the army authorities temporarily suspended the use of monoplanes by military airmen, in consequence of a report on the constructional weakness of the type by M. Blériot. This temporary ban has since been removed. On this side of the Channel, the month was notable for the holding of the first Hendon meeting, which inaugurated a remarkably successful series of competitions lasting throughout the year. The Royal Aero Club issued a set of suggested regulations for the prevention of collisions in the air, and also made public a set of rules for the conduct of open competitions. Mr. Roger Wallace, K.C., retired from the Chairmanship of the R.Ae.C., and was succeeded by Sir C. D. Rose, Bart.

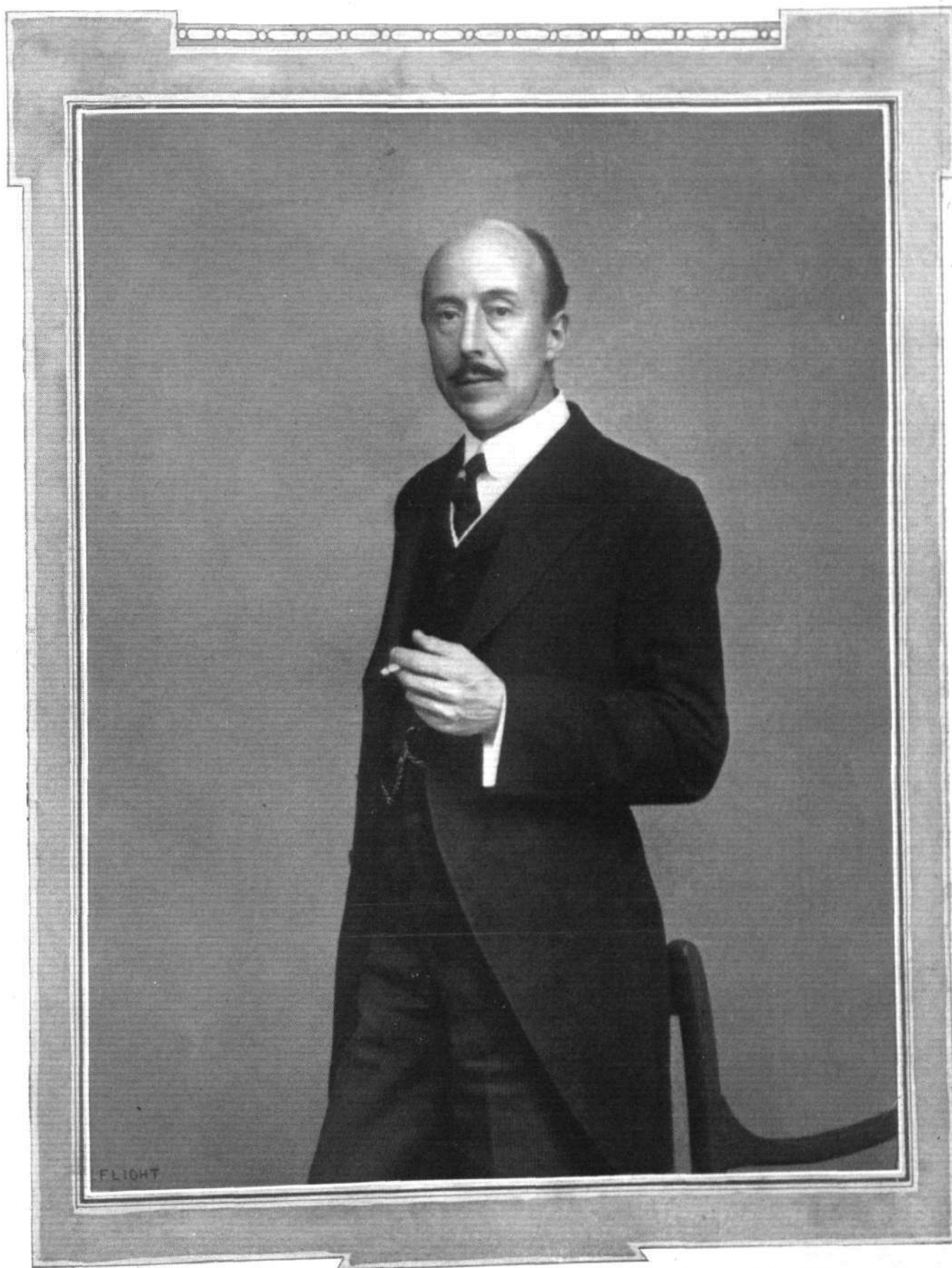
In April the first cross-Channel flight by a woman pilot was made by Miss Harriet Quimby, and the St. George's Channel was crossed by an aeroplane for the first time, Mr. Corbett Wilson being the pioneer. Mr. D. L. Allen lost his life in essaying a flight from Holyhead to Dublin in the same week that his friend Mr. Wilson succeeded in crossing from Fishguard to Enniscorthy. This month was interesting for the holding of the first review of military aviators and machines, M. Millerand, the French Minister of War, inspecting a detachment of no less than 26 fully equipped aeronautical units.

May was a notable month in British military aviation. His Majesty the King signalled his interest in the Navy by going to sea with the Home Fleet and during the course of the manoeuvres which took place, some impressive exhibitions of flying were given by officers attached to the Naval Flying School at Eastchurch, the battleship "Hibernia" being equipped as a "mother-ship" for the hydro-aeroplanes employed. Later in the month the King and Queen again manifested their interest in flying by witnessing aerial manoeuvres at Aldershot by both aeroplanes and the small dirigibles which have been used in the Southern Command for experimental work. During the month the conditions for the War Office Trials of aeroplanes were issued, and, though subjected to criticism in detail, were in the main regarded as satisfactory except in the smallness of the prize-money as compared with the large sums set aside by the French Government for similar purposes in 1911. The *Daily Mail* inaugurated an expansive scheme of aeroplane tours about the country with the object of arousing popular interest in flying. A number of airmen were retained and proceeded to various resorts, there to give exhibitions of flight, and a good deal of interest was thereby created. The month brought to aviation an almost irreparable loss in the death of Mr. Wilbur Wright, who died from illness at his home in America. As the virtual pioneer of dynamic flight, his loss was keenly felt by all interested in the movement, irrespective of nationality. At home, the month was marred by yet another fatal accident, in which Mr. E. V. B. Fisher and Mr. Mason lost their lives while flying at Brooklands.

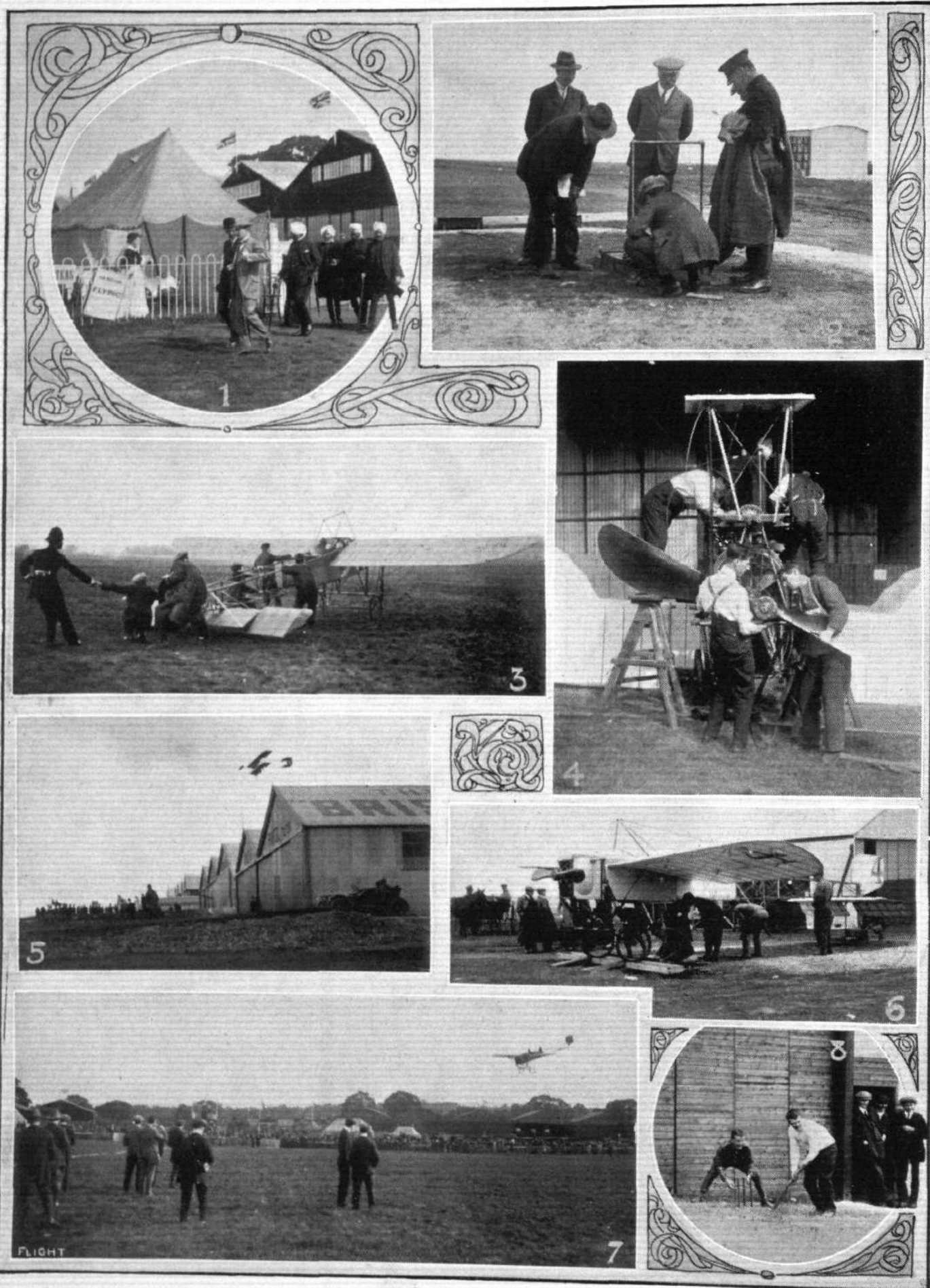
June was a busy month both at home and abroad. Many notable flights were made, particularly in France. The principal event contested was the race for the Grand Prix of the Aero Club de France, over a course known as the Anjou Circuit. This was won by Garros, on a Blériot machine. Great Britain was represented by a single competitor, Mr. Gustav Hamel, who had bad luck and retired. At home, the "Aerial Derby," which took the form of a race round London for prizes given by the *Daily Mail*, aroused a great deal of popular interest, it being calculated that considerably more than a million people witnessed the race from various points of vantage around the outskirts of the Metropolis. Unfortunately, the race was the subject of protests, which caused a good deal of discussion. Ultimately, Mr. T. O. M. Sopwith was adjudged to be the winner. During the month another fatal accident was recorded to British flyers, Capt. Loraine and Staff-Sergt. Wilson being killed on Salisbury Plain while flying a Nieuport monoplane. In the politics of aviation June was a somewhat notable month. His Majesty the King graciously consented to become Patron of the Royal Aero Club. The Federation Aérienne Internationale held a Conference at Vienna at which the subject of the codification of an international law of the air was discussed at great length, and a suggested basis of such laws drawn up and agreed upon by the Conference. Naturally, this suggested code is of no effect in the meantime, but it will undoubtedly form a working basis for any codification of laws by the civilised Governments of the world, when it is adjudged that the time is ripe for legislation, and it is therefore a work of the utmost importance to the future of aviation. During June, Lord Haldane left the War Office to become Lord Chancellor, and was succeeded by Col. Seely, whose interest in aviation was thought to be a sufficient earnest of things moving



MEN OF MOMENT IN THE WORLD OF FLIGHT.



Mr. MERVYN O'GORMAN, Superintendent Royal Aircraft Factory.



REMINISCENCES OF 1912.—1. Visit of the King's Indian Orderly Officers to Hendon. 2. Sir George White getting weighed on Salisbury Plain. 3. Marcel Desoutter starting for a flight at Hendon. 4. Cody helping his mechanics to erect his machine at the Army Trials. 5. Pierre Verrier flying the Maurice Farman in a 25-mile wind at the Army Trials. 6. Weighing the Bleriot at the Army Trials. 7. A *vol plané* by Gustav Hamel and Miss Trehawke Davies at Hendon. 8. Vedrines playing cricket on Salisbury Plain.





"Flight" Copyright.

REMINISCENCES OF 1912.—1. Raynham, on the Burgess-Wright, and Lewis Turner, on the Grahame-White 'bus, putting up a fine finish in the order named for the "Shell" speed contest at Hendon on Aerial Derby day. 2. The Martin-Handasyde flying at Salisbury Plain. 3. Sabelli, on the Hanriot, and Hall, on a Blériot, flying at Hendon. 4. Visit of the King and Queen to Ranelagh to witness the flying of Gustav Hamel. 5. Valentine flying on a Deperdussin at Hendon. 6. B. C. Hucks starting for a flight at Hendon. 7. Mr. Sydney Pickles on the Caudron biplane flying at sunset. 8. The Martin-Handasyde.

at a more rapid rate in the future, so far as our aerial forces are concerned, and to some extent the feeling has subsequently been justified. During this month, too, a suggestion was made for a competition of very wide interest, this being no less than a proposal to organise a race from London to Karachi. It was intended that the event should take place some time in the autumn of the year just ending, but up to the present the organisation has not been completed, though we believe that arrangements are being proceeded with and that the race may be held before many months have passed.

The month of July was practically barren of notable achievement. The weather conditions prevailing at home and throughout Europe were such as to practically preclude serious work in the air, and nothing of much consequence falls to be recorded. The Aerial League came forward with a proposal that a public fund of a million shillings should be raised in order to encourage the cause and practice of aviation. It met with a favourable reception at the start, but nothing much has been heard of it lately. During the month another well known aviator met his death by accident, though not in the air. This was M. Hubert Latham, who was killed by a charging buffalo while big-game shooting in the Congo region.

In many respects August was the most noteworthy month of the year so far as British aviation is concerned. The War Office Trials of aeroplanes were held on Salisbury Plain, and in spite of the really awful weather that was experienced they proved highly instructive. These Trials were dealt with at very considerable length, both from the descriptive and the technical points of view, in the pages of FLIGHT, so there is no need to do more now than merely to touch upon them as a matter of record. The Trials resulted in the award of the first prize to Mr. S. F. Cody, who made a series of splendid performances on the Cody biplane, while the second place went to the French Deperdussin, the Bristol machines securing two third prizes. Mr. Cody also gained the £1,000 prize for the best performance by a British machine. During the Trials a new British height record was made by Mr. de Havilland, flying a machine constructed in the Royal Aircraft Factory and known as B.E. 2. The altitude attained was 9,500 feet. Unfortunately, the Trials were marred by a fatal accident, Mr. Fenwick, flying a Mersey monoplane in a high wind, being killed. British aviation claimed yet another victim during August, Mr. Lindsay Campbell, an Australian aviator, being killed while flying at Brooklands. Abroad some notable flights were made, the chief of which was the journey between Paris and Berlin, made by Audemars, this being the first time the distance between the two capitals had been bridged by the aeroplane.

September was a black month for the Royal Flying Corps, for in the opening week no less than four members of the Corps lost their lives. Capt. Hamilton and Lieut. Wyness-Stuart were killed at Graveley, near Hitchin, and Lieuts. Hotchkiss and Bettington lost their lives near Oxford. Both accidents happened while the officers concerned were flying across country to take part in the Army manoeuvres in East Anglia. In each case the machine being flown was a monoplane, and the two accidents, following within a couple of days of each other, led to the provisional prohibition of the use of monoplanes for Army work. This prohibition has not yet been withdrawn, though there is reason to think that it will be removed very shortly. Meanwhile, the ban only applies to machines in use by the military wing of

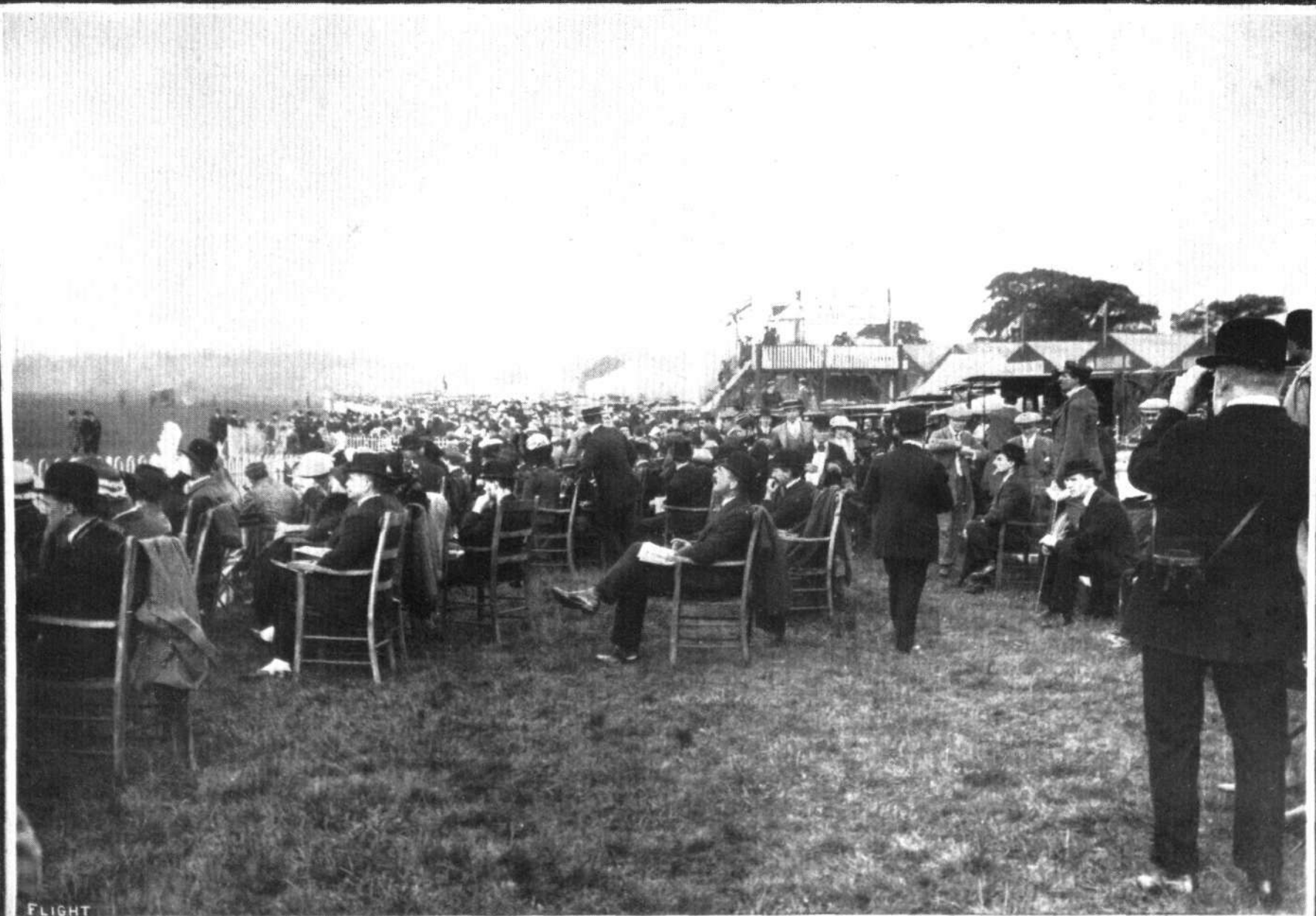
the Royal Flying Corps, and monoplanes are in constant use by the naval wing, no serious accidents having been recorded. During the manoeuvres use was made of aircraft, both aeroplanes and small dirigibles, to an extent unexampled in this country, and the lessons learnt will doubtless bear fruit in the immediate future. Certainly, the aircraft influenced the conduct of the operations, and one result has been that General Sir James Grierson, commanding the defending force, has since laid it down that it is impossible for a commander to successfully conduct war unless he has first obtained command of the air. Such a dictum as this falling from so distinguished a commander as Gen. Grierson cannot fail to have a great deal of weight with those who conduct the military policy of the country. In France and Germany aeroplanes and airships were made use of to a very large extent during the annual manoeuvres and with uniform success, many important lessons having been learnt with regard to their influence on military operations. The Gordon-Bennett race was held in America during this month and resulted in a hollow victory for France, Vedrines having a virtual walk-over. Great Britain was not represented in the race. In France, Legagneux created a new world's altitude record by ascending to the enormous height of 18,650 feet.

The month of October was a fairly active one at home, principally on account of the competition for the Michelin Cups which fell to be decided during the month. The British Michelin Cup No. 1 was won by Mr. G. T. Hawker, a young pilot flying a Sopwith-Wright biplane fitted with an A.B.C. engine, who achieved a non-stop flight of 8 hours 23 mins., while Cup No. 2 was won by Mr. S. F. Cody, who completed a circuit of 186 miles. In France, Daucourt, flying a Borel in the competition for the Pommery Cup, flew 550 miles in a single day and at the time of writing his performance has not been beaten. An extended official report on the Military Aeroplane Trials was issued in the course of the month and excited a good deal of interest.

In November, the latest Zeppelin airship built for the German navy made a continuous voyage of considerably over a thousand miles, and something in the shape of a sensation was caused by the report that during the progress of this voyage the vessel had passed over Sheerness during the night. It was circumstantially reported that a mysterious airship had passed over the town and garrison, and several questions were asked in Parliament in connection with the matter, but it has been categorically denied that the Zeppelin was anywhere near at the time, and the mystery of the strange craft has not been cleared up. During November and December, many questions have been addressed to the First Lord of the Admiralty and the Secretary for War, in connection with the inadequacy of our aerial forces for purposes of defence, and from the tenor of the replies there is reason to hope that before long matters will receive the attention they merit. Aviation in December suffered a further grievous loss in the accident resulting in the deaths of Lieut. Parke, R.N., and his passenger, Mr. Arkell Hardwick.

## General Advancement.

In writing our review of 1911 we recorded the opinion that while the science of aviation had made tremendous strides during the year, it was difficult to say to precisely what main causes this was due. That, we think, can equally well



IN THE SUMMER DAYS WHICH HAVE GONE.—A typical crowd watching one of the splendid flying exhibitions, which have been such a feature of the aviation world, at the London Aerodrome at Hendon during the past year.



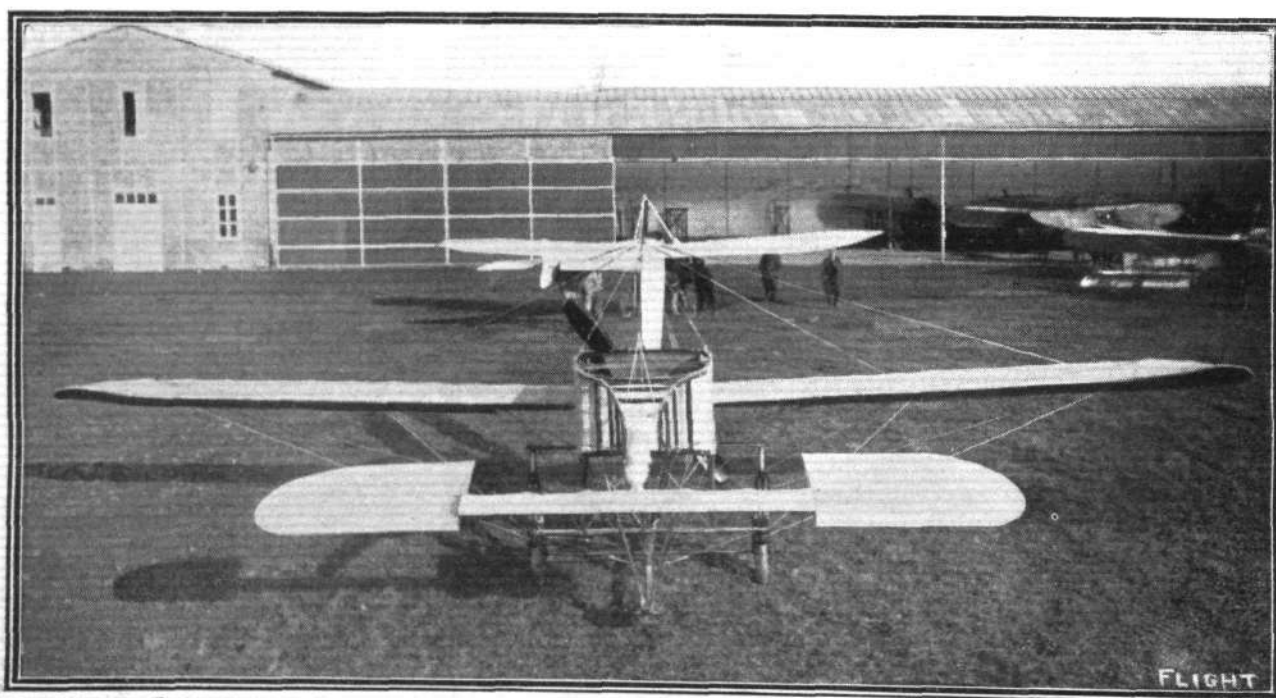
be said of the year which ends on Tuesday next. Engines, aeroplanes and pilots have all played their part in contributing to the forward movement. So far as appearances go, the aeroplane, as such, is fairly much the same as it was in the main essentials of its design. Progressive improvement in detail there has been, and must be in the future, but it is as true now as it was at the end of 1911 to say that no radical departures have been made from the accepted types. It is equally true to say that the increased and increasing skill of the pilots is accountable for much that might, without thinking, be laid to the account of improvement of the machine itself. That experience teaches is probably more true of the practice of flight than of most other things, and between the greatest experience of the men and the improvement of the machine and its motor the sum total of the year's progress is a very considerable one.

One significant feature of the year has been the better showing made by aircraft of the dirigible type. There has been a noteworthy absence of the disasters which have overtaken these craft in previous years, and we are strongly of opinion that if 1912 has taught no other lesson in connection with the lighter-than-air type, it is that it occupies a distinct and important place of its own in aeronautics. In Germany in particular, immense strides have taken place in the development of these craft, especially of the rigid Zeppelin type, and many notable voyages have been accomplished by them. Not only have the Zeppelins proved themselves successful, but it looks as though many of the difficulties surrounding the construction of airships of the semi- and non-rigid types have been overcome by various constructors. In this country the amount of research work which has been done in connection with large dirigibles has been practically negligible, the work having been confined almost entirely to experiments with the comparatively small craft built in the Royal Aircraft Factory. At the present time the Nation has on order a Parseval semi-rigid airship from Germany, and an Astra-Torres from France. In addition to this, it is said that the

Admiralty has ordered, or intends to order very shortly, one or two large sized dirigibles from other countries. Since the failure of the Barrow airship no attempt has been made to construct a large vessel in England. Much attention, however, has been directed to the doings of these machines abroad, and the conviction appears to be taking shape that there are immense practical possibilities in the dirigible, as indeed we have insisted at various times during the year, and we may shortly see this conviction crystallise into some material action.

## The Government Attitude.

While it would be impossible to say that the Government attitude towards aviation is an entirely satisfactory one, it can at least be laid down that it is far better than it was a twelve-month ago. Then we were not only hopelessly behind our rivals but there seemed no prospect of things bettering themselves during the year to come. During 1912 something has at least been done, and although we have hardly commenced to make up the leeway, still the outlook is nothing like as disquieting as at the end of 1911. At the same time, it is sufficiently alarming in view of the extremely unsettled state of the European political barometer. It is no exaggeration to say that at any time during the past three months we might have found ourselves suddenly at war with a first-class power and the danger is by no means past yet. To say that in the air we are ready for such an eventuality would be a simple piece of pure exaggeration. We are not ready by a very long way. We have neither the machines nor the trained pilots to man them if we had. True, there are 380 British pilots on the roll of the Royal Aero Club, but willing as every one of them might be to give his services in time of war by far the greater proportion entirely lacks the military knowledge and training to make those services of any great value. However, these are all matters with which we have dealt from time to time during the year and which we shall continue to comment upon as occasion arises.



THE NEW BLÉRIOT "CANARD," SEEN FROM IN FRONT.—In the background is the new Blériot monoplane which was at the Paris Salon.



## THE WEMBLEY DISASTER.

AT the inquest held at Wembley on Wednesday week to inquire into the fatal accident to Lieut. Wilfred Parke and Mr. Arkell Hardwick on the 15th inst., the evidence did not throw much further light on the cause of the catastrophe, but some questions by the Coroner, Dr. Gordon Hogg, amongst other things brought forth testimony as to the stuff our Service flyers are made of.

After the bodies of the unfortunate victims had been formally identified, the Coroner said he wished, on behalf of the jury, to express to the relatives their sincere sympathy. The Navy would mourn the loss of a promising officer, and the country would regret the loss of two fine sportsmen.

Mr. Raymond Woods, who officially represented the Admiralty, expressed their lordships' sincere regret at the fatality, and added that the Admiralty realised that in a corps especially distinguished for its bravery and daring, there were none who surpassed Lieut. Parke in these qualities.

The Clerk of the Wembley Parish Council, the Vicar of the parish (who acted as foreman of the jury), and Mr. Handley Page also, expressed their sympathy with the relatives.

Mr. Fred. Osborne, of the Wembley Golf Club, who witnessed the fall, said, when he first saw the machine it was following the usual track from Hendon to Brooklands. It was high up and going along steadily. It was rocking a little, but nothing out of the way. There was a strong, gusty wind. The machine was continuing on its course, and then it seemed to turn almost at right angles to the left, and came towards him rather on his left front. Then the wind seemed to catch it, and it drifted until it was almost coming right at him. The engine was going all the time. It seemed to be planing down, and then it got over the trees on the crest, and it turned completely round, so that it was returning in a line parallel to its original direction.

He gathered that it was going back to Hendon, but as it turned the tail seemed to come round. As the tail came round, the wind caught it, and turned it right round, and it fell to the ground at an awkward angle. The machine came nose down.

He did not consider it was too windy for a flight. Had the aeroplane continued in the same direction the accident would not have happened.

Mr. Herbert Sharp, another eye-witness of the accident, said it seemed as if a gust of wind came along and caught the aeroplane, which seemed to dive to the earth. During the last 150 ft. of the fall he certainly did not think that the aviator had any control over the machine.

The Coroner inquired whether individual lieutenants were allowed to experiment with any machine, and, at the suggestion of Mr. Woods, Lieut. J. W. Seddon was called to answer the question.

The Coroner: Can you tell the jury what liberty they have to try machines other than those recognised by the Navy?—We have complete liberty to try machines if we are not on duty at the time.

Any machine, freak or otherwise?—Yes, sir.

I suppose your men are very keen?—Yes.

Don't you think it is rather risky that men with the chance of promotion before them should have entire liberty to fly any machine which may come before them?—We look on the matter in this

way. It is a very young science, and it is very hard to say what is a good machine and what is not a good one—what is not a safe one. It is a good thing to get experience of all kinds.

Don't you think from the fact that the science is very young that the danger is all the greater, and that some care should be taken in order to check keenness of this kind?

Lieutenant Seddon replied that it should be left to their discretion.

Don't you think that such valuable lives as these should, to some extent, as far as flying is concerned, be safeguarded by rules as to the machine they should fly when off duty?—It is so hard to say whether one machine is safer than another.

You think it would be unwise to check them?—I would rather not answer.

Mr. Woods: I take it in practical work no officer would fly in what was regarded as a freak machine unless he was pretty confident of it?—No. As a matter of fact, the danger arises not so much from the machine in which you are flying as from the weather. Lieut. Parke was running no more risk when flying in this machine in this weather than he would have been in any one of half-a-dozen other machines under such conditions.

If there is any control to be exercised it should be exercised in regard to the weather conditions in which officers are permitted to ascend rather than with regard to the kinds of machine they use?—It is hard to say what the conditions are above, and you cannot judge by what they are down below.

The Coroner said he did not think men of such keenness should be allowed to try any machine that came in their way without any restriction being laid down.

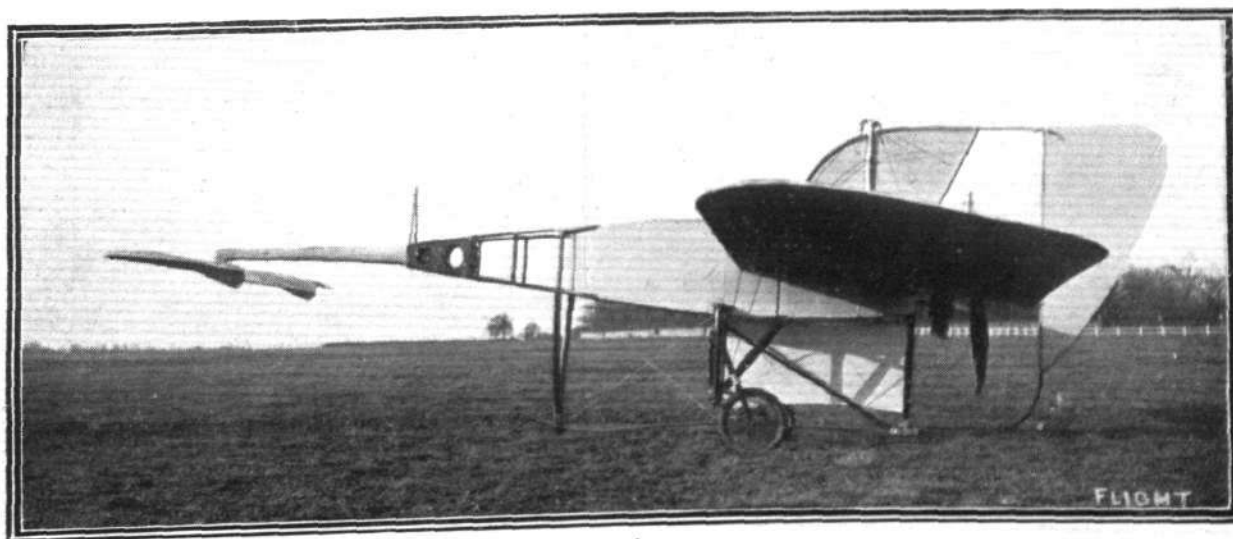
Mr. Handley Page gave evidence as to the construction of the machine and the work it had accomplished. He had carefully gone over the ground since the accident to examine the contour of the place. The golf course was on the side of a hill, with a valley running at one side. On the side opposite the club house there were a couple of trees stretching to the ridge. From what he could gather, the machine passed over the trees at the top of the hill, and on the ridge it seemed to have negotiated the turn very successfully, though that was rather a difficult operation. The aviator apparently dived in turning, and attempted to go back to Hendon, or else to land—it was rather difficult to form an opinion as to which. He apparently met a very strong current, and witness believed that a second dive was caused because there was no air at the point at which the first dive should have ended.

The Coroner: This is one of the inevitable risks which must occur to everyone?—Yes, if you are flying low.

Have you lost confidence in the machine through anything which has occurred?—I do not think the aeroplane has the slightest thing to do with that. I examined carefully the whole structure of the machine, and nothing had given way.

The medical evidence showed that Lieutenant Parke's death was instantaneous while Mr. Hardwick only survived for a few seconds.

A verdict of accidental death was returned, and the jury added a rider to the effect that officers of the Royal Flying Corps should not be allowed to make experimental flights without the permission of the authorities.



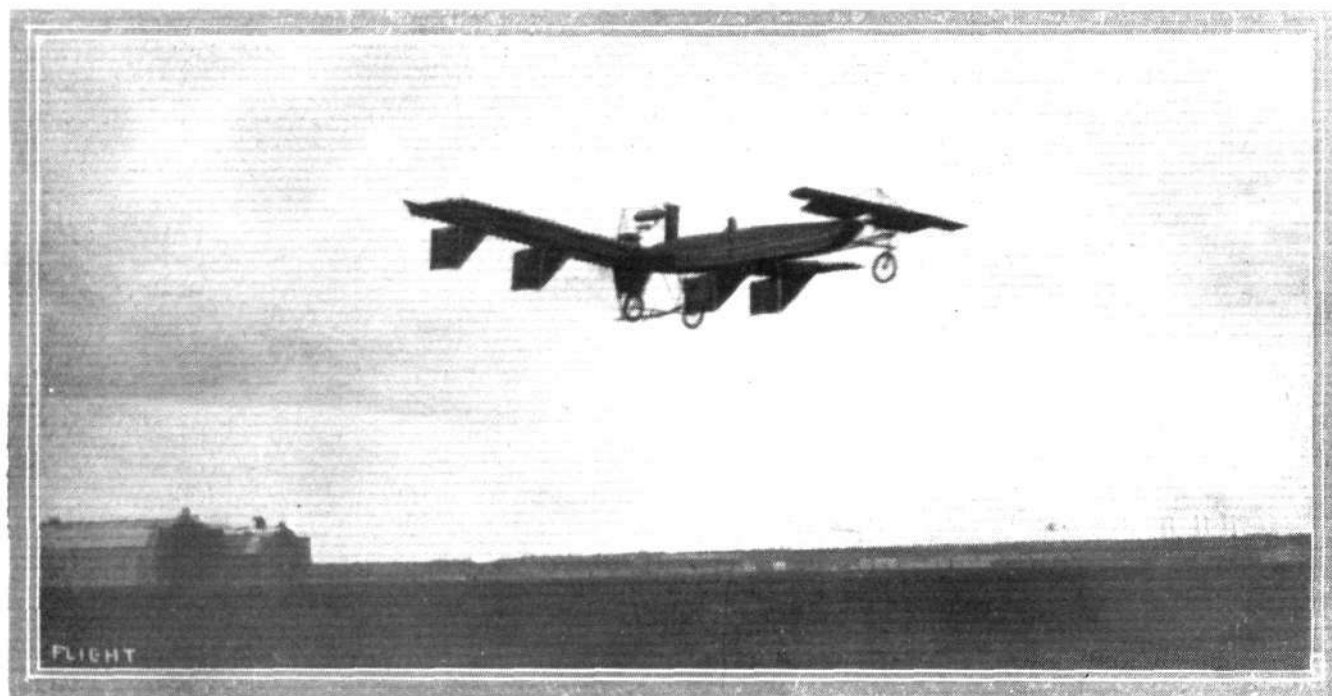
THE NEW 70-H.P. GNOME-BLÉRIOT "CANARD."—Side view.

## SOME GERMAN MACHINES.

By G. B.

DURING the last year or so great strides have been made in Germany in the development of the aeroplane, although the progress has been by no means easy, owing to the way in which the dirigible has captivated the mind of the public. While the aeroplane was developing from the "fledgling" stage in France, the success of the three different types of dirigible, Zeppelin, Gross and Parseval, was keeping Germany so occupied that there was practically no room for consideration of heavier-than-air machines. Still, in spite of the lack of encouragement, both practical and moral, a few experimenters bravely struggled on, and one of them, Herr

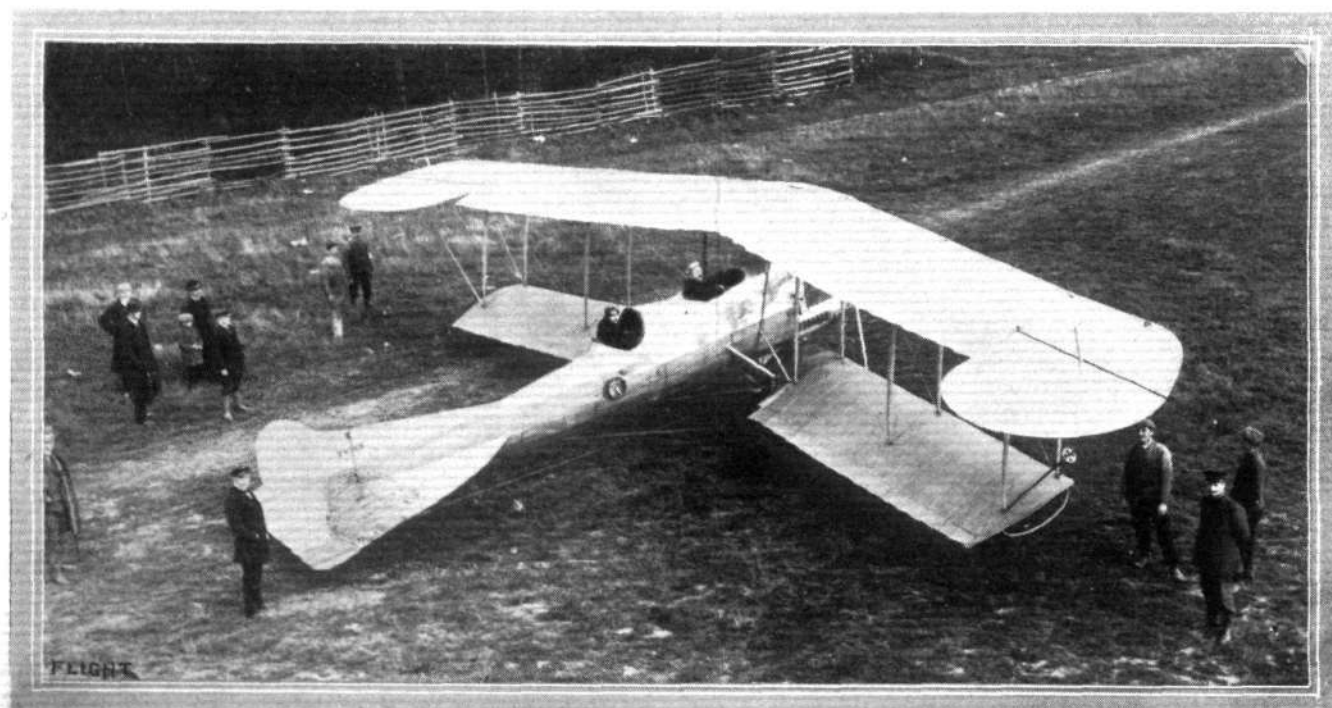
Wright made the first real flight in the country, at the Templehof, on August 30th. This was followed by meetings at Berlin, Cologne, &c., at which the flying of Henry Farman, Louis Blériot, the late Hubert Latham, Leblanc, Rougier and others served to arouse a good deal of interest. Then, at the end of October, Grade succeeded in winning the Lantz prize of £2,000, by making a figure "8" round two posts placed a kilometre apart, and showed his countrymen that it was possible for an entirely German-built machine to fly, for not only had Grade built the machine himself, but he had also constructed the engine.



The experimental "canard" monoplane of Prof. Reissner, with four rudders under the main plane. This was flying recently at Johannisthal.

Grade, was, at the end of 1908, rewarded by one or two hops of a few hundred yards in length, at Bork, near Berlin. He was using a monoplane which he had evolved after experimenting for a considerable time with a triplane. Very little more was heard of aviation in Germany until the following summer, when Orville

About this time, several firms commenced to build, under licence, copies of successful French machines, and also as a result of Orville Wright's visit to Berlin, a company was founded to build Wright biplanes in Germany. At first these machines were purely copies of the original types, but in course of time the various firms evolved

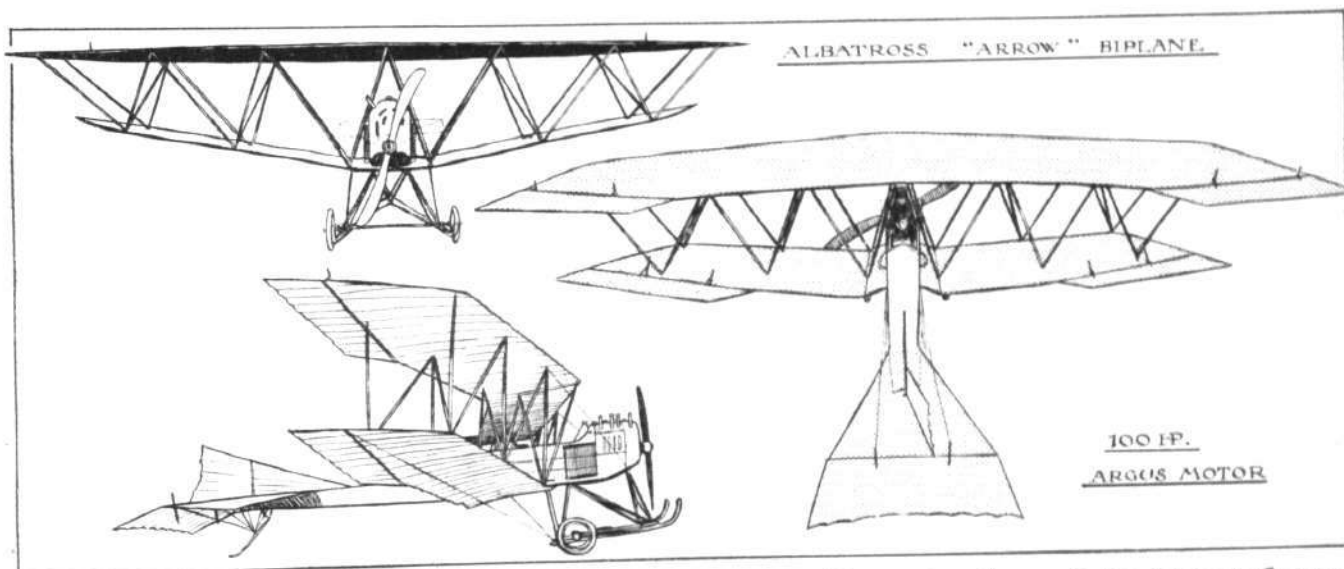


The Mars biplane, the fuselage and landing chassis of which are exactly similar to that of the Mars monoplane.

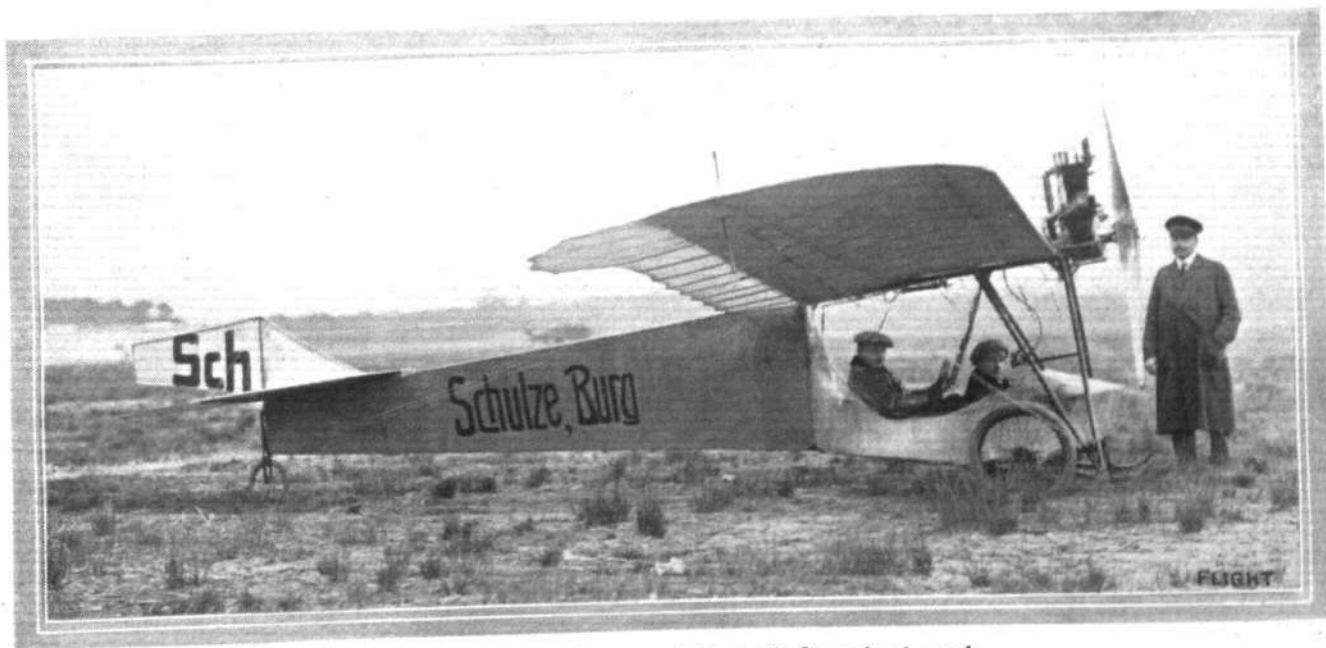




The Jeannin monoplane in its latest form, as seen at the Johannisthal flying ground near Berlin.



Three sketches showing the latest developments of the Albatross "Arrowplane," one of the foremost German biplanes. The chassis and triangular system of struts remains the same as on the machine exhibited at the Paris Salon in 1911, but the planes now have a flattened V form, with ailerons, instead of being of the Etrich type.



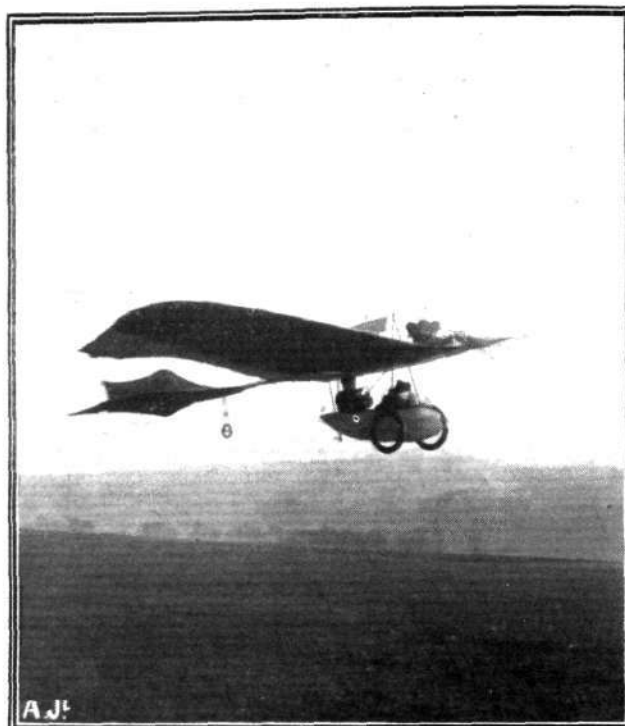
A Schulze monoplane, specially built for school work.

improvements, and now there are few of the latest aeroplanes which bear much resemblance either to their prototypes or to the latest productions of the French constructors.

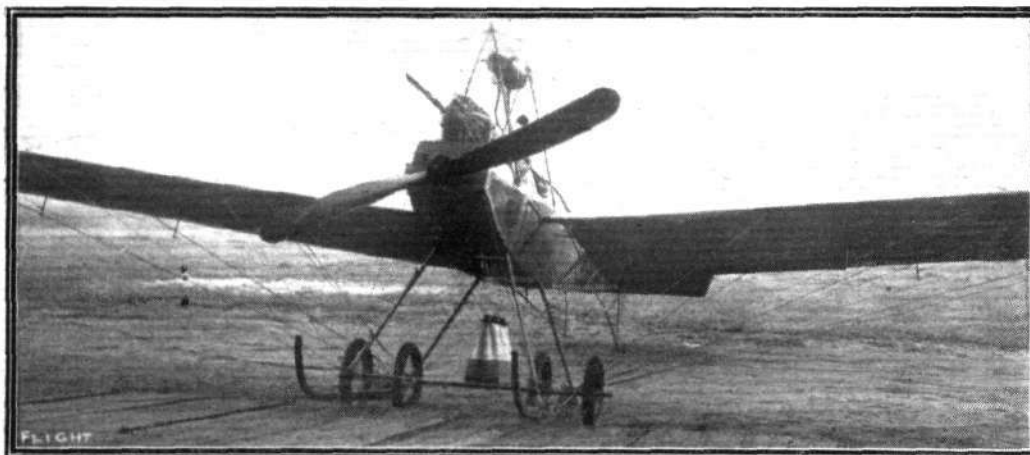
Generally speaking, it may be said that while the French designers have been striving mainly for speed the Germans have paid a great deal more attention to the question of lateral stability. This will be obvious from a study of the accompanying photographs, which we are enabled to reproduce by the courtesy of our contemporary *Flugsport*. In monoplane design the influence of Grade and also of Etrich has been very marked, many machines having the underslung position of the pilot of the former, while the bird-shaped plane, evolved by the latter in a modified form, is quite common. When the Etrich monoplane assumed a practical form in Austria in 1910, arrangements were at once made for it to be manufactured in Germany, and under the name of Rumpler-Taube or Pigeon, it has proved very successful in competition, and has also been favourably received by the military authorities. With regard to biplanes, the Albatross Co. exhibited at the 1911 Paris Salon one of their machines in which the tips of the upper plane were arranged somewhat on the Etrich plan. Since then, however, this firm have abandoned this system in favour of main planes with a flattened V form similar to the "Lohner" arrow "plane," entered for the British military trials. The Mars biplane is on more or less the same general lines.

As speed has not been deemed so important, German designers have given a good deal of attention to the comfort of the pilot and passengers, and their machines are generally very substantial both in size and construction. Being past masters in the art of metal work, they have displayed great ingenuity in casing in the motors, &c., while automobile practice has been largely followed.

In the review of the 1911 Paris Salon reference was made to the splendid workmanship of the Albatross biplane, which was also dis-



One of the newest Grade, military-type, monoplanes.



One of the latest military-type Harlan monoplanes recently delivered to the Turkish Army.

tinguished by the use of diagonal compression struts, thus obviating the use of wire bracing. This system is continued in the latest machine, and is well illustrated in the three sketches herewith, which also show the strong landing chassis employed. Another characteristic feature is pronounced dihedral angle of the lower planes. In last year machines a flexing tail was employed, but this has now been replaced by an elevator. In the Mars biplane ailerons



## Garros Flying from Tunis to Paris.

HAVING achieved his object of regaining the height record, Garros conceived the idea of making the journey back from Tunis to Paris on his aeroplane. After having had everything in readiness for three days, he was able to make a start on the morning of December 18th. Setting out from Tunis he flew round the Bay of Tunis to Cape Bon and then struck across the Mediterranean for Marsala in Sicily, where he effected a safe landing, the distance covered being something over 150 miles. After a rest, Garros restarted and flew along the coast of Sicily to Trapani, where in landing he slightly damaged his petrol tank. On Saturday Garros made another start, flew across to the mainland of Italy, and reached Naples. He arrived at Rome on Sunday afternoon. From there the course will be more or less familiar to him, as it will be remembered that he was second to "Beaumont" in the Paris to Rome race. He is using a Morane-Salnier biplane, fitted with a 50-h.p. Gnome engine and Chauviere Integral propeller.

are only fitted to the upper planes. The fuselage and landing chassis of this machine is exactly the same as on the monoplane turned out by the same manufacturers, and, except for the wings of course, the various parts of the machines are interchangeable.

The photograph of one of the latest military type Grade monoplanes shows that the design, in its general lines, has been very little altered from the original machine, what changes there have been being mainly in the nature of detail improvements. The Schulze monoplane, which we illustrate, has been built mainly for school work, and the design is a little reminiscent of the Train machine in France. The Jeannin follows very much on Hanriot lines.

A machine which has achieved success, not only in its own country, but elsewhere, is the Harlan, a number of which were supplied recently to the Turkish Army.

In another photograph is seen a "canard" monoplane, with four rudders arranged under the main plane, with which Professor Reissner has been carrying out experiments at Johannisthal. Another somewhat unusual feature is that the planes are of special corrugated formation.

## Steel Work in Aeroplanes.

A BOOK that may be of some interest to aeroplane constructors who are using, or who contemplate using, steel work to take the place of timber, is one written by A. E. Berriman and just published from these offices (price 5s. 6d. post free). The subject is "Notes on the Materials of Motor Car Construction," but inasmuch as the metallurgy of steel has a common interest to all who use it, the book may, as we have said, be considered to have a general application to aeroplanes in this sense.

Part I, which is written for the general reader, deals in a very elementary way with the processes involved in the manufacture of steel and with the effect that heat treatment produces thereon. In the second part of the volume, however, there are some notes based on modern practice, which may prove of deeper interest. Several of the illustrations are micro-photographs showing the structure of steel on a much magnified scale and illustrating the changes that it undergoes when it is heated and cooled.



# The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

## British Empire Michelin Competitions.

THE attention of Members is called to the Rules governing No. 2 Competition for the year 1913. The Prize is now increased to £800, this being the last year in which it will be offered. Competitors are reminded that the Prize can now be competed for.

BRITISH EMPIRE MICHELIN CUP No. 2, £800.  
(Under the Competition Rules of the Royal Aero Club.)

The Michelin Tyre Company has presented to the Royal Aero Club of the United Kingdom for competition by British aviators, the sum of £800, to which will be added a trophy to be retained by the winner.

The following are the rules governing the competition for the year 1913:—

1. The winner for the year 1913 shall be the competitor who, on October 15th, 1913, shall have completed a prescribed circuit of about 279 miles on an aeroplane in flight in the fastest time, reckoned in miles per hour.

2. Competitors may select their own circuit of about 279 miles, but the start must be made from a flying ground approved by the Royal Aero Club, and the proposed circuit must be submitted to the Royal Aero Club before the flight is made.

The complete circuit must be accomplished without alighting.

3. The flight must be observed at each point named in the circuit by officials appointed by the Royal Aero Club.

4. A number must be prominently displayed on the aeroplane in places approved by the officials, and when flying round each of the points selected in the circuit, the aviator must fly sufficiently low so that his number may be easily verified by the official observer.

5. The circuit must be completed between the hours of sunrise and sunset, on any one day.

6. The entrant, who must be the person operating the machine, must be a British subject, flying on a British-made aeroplane, must hold an Aviator's Certificate, and must be duly entered on the Competitor's Register of the Royal Aero Club.

7. The complete machine, and all its parts, must have been entirely constructed within the confines of the British Empire, but this provision shall not be held to apply to raw material.

8. An entrance fee of £1 must accompany every notification of an attempt, and at least three clear days' notice must be given to the Secretary, Royal Aero Club, 166, Piccadilly, London, W. A competitor must further deposit a sum of £10 on account of expenses, if any, of observers. Any balance not so expended will be returned to the competitor.

9. Should any questions arise at any time after the date of entry as to whether a competitor has properly fulfilled the above conditions, or should any other question arise in relation to them, the decision of the Royal Aero Club shall be final and without appeal.

10. A competitor by entering waives any right of action against the Royal Aero Club or the Michelin Tyre Co. for any damages sustained by him in consequence of any act or omission on the part of the officials of the Royal Aero Club or the Michelin Tyre Co., or their representatives or servants, or any fellow competitor.

11. The aeroplane shall at all times be at the risk in all respects of the competitor, who shall be deemed by entry to agree to waive all claim for injury either to himself or his aeroplane, or his employees or workmen, and to assume all liability for damage to third parties or their property, and to indemnify the Royal Aero Club and the Michelin Tyre Co. in respect thereof.

12. The Royal Aero Club reserves itself the right to add to, amend, or omit any of these rules should it think fit.

## International Aero Show at Olympia.

The International Aero Show held by the Society of Motor Manufacturers and Traders, under the auspices of the Royal Aero Club, will open on February 14th, 1913, and terminate on February 22nd.

Full particulars can be obtained on application to the Exhibition Manager, Society of Motor Manufacturers and Traders, Maxwell House, Arundel Street, Strand, London, W.C., or the Secretary, Royal Aero Club, 166, Piccadilly, London, W.

Members of the Royal Aero Club will be admitted free on production of their membership cards.

In connection with this Exhibition, a section for models will be organised by the Royal Aero Club, assisted by the Kite and Model Aeroplane Association. The Royal Aero Club will offer prizes amounting to £50 in this section. Full particulars can be obtained from the Secretary of the Royal Aero Club.

Models may be exhibited in the following classes:—

1. *Power-driven Models* (excluding rubber and spring motors).—Minimum duration of flight, 30 secs. 1st Prize, £12; 2nd Prize, £5.

2. *Models driven by any other motive power.*—

(a) *Rising from the ground.* Minimum weight, 8 oz. Minimum duration of flight, 30 secs. 1st Prize, £5; 2nd Prize, £2; 3rd Prize, £1.

(b) *Launching by hand.* Minimum weight, 4 oz. Minimum duration of flight, 30 secs. 1st Prize, £2; 2nd Prize, £1.

3. *Hydro-Aeroplane Models.*—Minimum weight, 8 oz. Minimum duration of flight, 15 secs. 1st Prize, £5; 2nd Prize, £2.

A tank will be provided in which the Models will float during the exhibition.

4. *Scale Models or Part Models*, embodying new design applicable to full-sized machines. A Prize of £10 will be awarded in this class at the discretion of the judges.

5. *Model Aero Motor* (excluding rubber and spring motors).—Prize, £5. The Model will be judged on a weight per horse-power basis, the ratio not to exceed 8 lbs. per horse-power. The weight is to include all accessories with fuel for a minimum run of two minutes, to be taken on a bench test, and the total weight is not to exceed 16 lbs.

The Judges in awarding the Prizes will take into consideration design, construction, duration of flight, and stability. The maximum marks to be awarded is 150, divided as follows:—Design and Construction, 50 marks; Duration of Flight, 50 marks; Stability, 50 marks.

The Royal Aero Club will erect suitable stands and provide the necessary attendants. No charge will be made to exhibitors for space, but an entry fee of 5s. per model will be payable. A reduced charge will be made in the case of collective exhibits from Model Aero Clubs.

Arrangements will be made for a practical demonstration of the Models entered in Classes 1, 2, 3, and 5, to take place shortly after the close of the Exhibition. The date and place will be announced in due course.

## Notice to Members.

Members are reminded that their subscriptions for the ensuing year become due on January 1st, 1913.

166, Piccadilly.

HAROLD E. PERRIN, Secretary.

## Another Gift by M. Deutsch.

ANOTHER generous gift is announced by M. Henry Deutsch de la Meurthe, and this time it is the French Navy which benefits. Through the Association Generale Aeronautique, which is doing so much to help forward the cause of military aviation in France, M. Deutsch has offered to the French Navy the 100-h.p. Renault-Astra Hydro-aeroplane which performed so well at the St. Malo Meeting.

## Fatal End to American Overseas Flight.

UNFORTUNATELY the worst fears of the friends of Horace Kearney, who left Los Angeles on Saturday week to fly to San Francisco, have been confirmed, as a message from Los Angeles states that the body of the pilot and that of his passenger, Mr. Chester Lawrence, have been washed ashore near Rodondo Beach.

## French Navy and Hydro-Aeroplanes.

FOLLOWING the announcement that the French naval authorities intend to go ahead in the matter of aviation and equip four new stations at Bizerta (Tunis), Bonifacio (Corsica), Nice and Dunkirk, comes a scheme for a big trial of hydro-aeroplanes. The competition will be conducted by the French Aero Club at Deauville at the end of next August, and the prizes will include one of £2,000 from the French Minister of Marine. In addition, the machine which gives the best results under the conditions, to be drawn up by the naval authorities and the Ae.C.F., will be purchased for £2,400 by the French navy, while the one placed second will be bought for £2,000. The Aero Club of France will put up some big prizes, while the towns of Deauville, Havre, &c., will contribute liberally to the prize fund.

## EDDIES.

CHATTING to a pilot friend the other day about the extraordinary things that sometimes happen in the air, he mentioned an instance which gives food for some reflection. He had started off from Hendon in the Brooklands direction when, on approaching the river at about 2,000 ft., he ran into a fog—one of the typical Brentford consistency. Thinking that if he turned to the left it might take him further into the fogbank, he pushed the rudder-bar over a little to the right, and with a slight bank began to swing round. Without any warning, in the middle of the turn, the right wing dipped to such an extent that he was perilously near being thrown out of the seat.

The machine slipped sideways a little, and then he managed to convert it into a nose dive with the motor running. Having got all suspicion of a side-slip off the machine, he pulled back his lever gradually to flatten out. To his surprise, the machine refused to do so, and continued going head downwards for a space of time that must have seemed infinitely longer to the pilot on board than the period actually occupied. However, at last the machine seemed to take notice of the controls, and straightened itself out on its own account. By that time he had flown out of the fog, and found himself only 500 ft. above housetops. Had he not been flying so high in the first case, the incident would certainly have ended disastrously.

Another friend who was joining in the conversation put it forward that, as a result of practical experience, he would have found the machine much more ready to answer the controls during a nose dive, if he had switched the motor off. It is incidents such as these that have given rise to the Royal Aero Club's request that the National Physical Laboratory should direct an investigation to determine the precise conditions that bring about such happenings.

Perhaps no one connected with aviation goes through a more nervous time and gets so small a share of the limelight as does the average school instructor. He has to be out with his pupils as soon as it is light enough in the morning to fly, and there he must remain until the approaching darkness puts an end to flying for the day. There is little "joy riding" for him. His is a never-ending grind round the aerodrome, teaching pupils the principles of how to control an aeroplane. And when he is sitting in the passenger seat behind a pupil who has taken over the levers for the first time, he must be in a much more uncomfortable state of mind than ever a "stunt" flyer was when carrying out his most "hair-raising" manoeuvre. The "stunt" flyer has his controls and his confidence in being able to use them successfully; the instructor, in this case, has not.

But still, the instructor must draw a great deal of satisfaction from seeing the progress his pupils make while they are under his care, and after he has turned them out fully qualified pilots. But this is not achieved without the expense of energy. As an example, consider the enormous amount of instruction that the Bristol School pilots, Messrs. Jullerot, Pizey, Fleming (before he

left them), Harrison, Busteed and Pixton have gone through. And often, I believe, pupils are not nearly so thankful as they might be for all the care that is bestowed upon them.

Mr. Merriam, the present Bristol School instructor at Brooklands, seems, by the way, to be making a record in instruction. He has, since he took charge there, put through 26 pupils for their tickets, without, I believe, a single smash.

Down at Brooklands, *habitués* will soon see the re-appearance of the Coventry Ordnance biplane—"The Cow," as that machine is locally termed. It will be remembered that in the designing of this machine Mr. W. O. Manning based his calculations relating to the lifting power of the planes on the results that M. Eiffel had arrived at by laboratory experiments. When the machine was built, however, it was found that there was a considerable discrepancy between the results expected and the results actually arrived at. However, there is little doubt that when the machine re-appears it will be found that that trouble has been completely remedied, for the former planes have been replaced by an extended Farman-type *cellule* of considerable span.

For some time past now a rumour has been going about in French aviation circles that soon after the Paris Salon, the German Government placed with the French Hanriot firm an order for 150 monoplanes. To give colour to the rumour, it has been said that, amongst other orders for engines, the Hanriot firm passed along to the Rossel-Peugeot company one order for 50 of their rotary engines. So far, the report has neither been confirmed nor contradicted, and it would be interesting to know the real truth of the matter. Meanwhile, a certain section of the people in France are wondering whether, if the report be true, the French Government will allow these machines to be delivered.

Readers will be interested to hear that Mr. W. H. Ewen and his partner, Mr. A. M. Ramsay, have successfully formed a private company with a capital of £15,000, with the object of developing aviation in Scotland and elsewhere. The new company will also take over the running of Mr. Ewen's successful school at the London Aerodrome at Hendon. As we remarked recently, Mr. Ewen has renewed his lease of the Lanark Aerodrome, where he formerly had a school in operation. He intends to re-open the school there and run regular flying exhibitions. He is also negotiating for obtaining the use of a clear stretch of ground near Glasgow, where he will open a school and probably run flying exhibitions on a similar sort of basis to those that have been so eminently successful at Hendon. That ground, near Glasgow, so I have heard, has about as good a situation for an aerodrome as it would be possible to find. It is quite flat, it has an area of about 170 acres, and is only 20 minutes' tram ride from the centre of Glasgow. Further, a train line runs along one side of the ground, where it will be possible to erect a halt and so bring people to see the flying, with a minimum of trouble to themselves. So let us wish him success for, all along, Mr. Ewen has been a hard worker.



Having insufficient room for the construction of machines at Brooklands, Mr. T. O. M. Sopwith has leased a skating-rink in the Richmond Road, at Kingston-on-Thames, where he will establish his works, which will be under the management of Mr. Segrist, who accompanied Mr. Sopwith during his successful tour in the States, and who was responsible to a great extent for the design of the Sopwith tractor biplane. By the way, a skating-rink should make an exceptionally good shop for the construction and erection of aeroplanes, for what is the chief factor in a skating-rink, a smooth floor, dead level, with a large area, is also the chief desirability of an aeroplane erecting-shop.

I believe I am right in saying Messrs. Hewlett and Blondeau's works at Clapham Junction heard the rumble of the rollers before they, and, formerly, Messrs. Mulliners, took possession of it. There is also a rink at Cricklewood quite near Hendon which would be extremely suitable as an aeroplane works which some few constructors have had their eyes on for a considerable time.

A little volume has been written by Miss Ethel Hamilton entitled "Soldier and Aviator," in which she reveals to

the public the inner feelings of her brother, the unfortunate Captain Patrick Hamilton, of the Royal Flying Corps, who was killed by a fall from his monoplane during the past Autumn Manœuvres. From its very commencement, where Miss Hamilton dedicates her work to the memory of "A Devout Soldier"—her father—whose four sons died serving their King, the volume is one of pathetic interest, for it tells of the enthusiasm that the late Captain Hamilton held for aviation, not as a sport or a pastime, but as a means of serving his country, and of the sacrifices he made to follow his convictions.

Since he had the misfortune to sustain a serious accident in the early part of this year, Charles Hubert has been very little heard of in connection with aviation, therefore it is interesting to hear, in a letter I received from him recently, that he has been engaged by the French Astra Co. to fly a 100-h.p. Renault-engined hydro-biplane of that firm's construction at Nice during the four months commencing New Year's Day. And very nice too. Is there anyone here in London who would not willingly exchange our metropolitan winter for the Côte d'Azur? We shall hear of him at the Monaco Meeting.

"OISEAU BLEU."

## FROM THE BRITISH FLYING GROUNDS.

### Brooklands Aerodrome.

**Bristol School.**—Merriam made the first flight Monday, last week, but after two circuits came down and no other ascents were made before breakfast. Later on in the morning Merriam took Lieut. Lee, a new pupil, for his first flight and found conditions too bad for pupils' solos. Merriam was out as passenger on straights with Capt. Powell, but wind rose and stopped further work.

Bendall made a test in the afternoon, after which Lieut. Todd and Mr. Ewing made several circuits each in fine style, both pupils flying really well. Mr. Featherstone was also out for two really good circuits. Capt. Powell was out for straights with Merriam up behind, after which this pupil flew alone. Bendall was on another machine for a test, afterwards taking Lieut. Lee for tuition, who was also out with Merriam.

Merriam flying round quite early, Tuesday, trying to wake up pupils. Lieut. Todd was first pupil up, making several circuits in great fashion, and should have no trouble in taking his certificate at the next available opportunity. Mr. Featherstone, who is also ready for his *brevet* tests, made some good circuits with figures of eight. Lieut. Empson and Mr. Ewing were both out for good circuits, these pupils making fine progress, and Bendall was at the same time out with Lieut. Lee. Merriam took same pupil, giving him charge of the control at intervals. Capt. Powell was up for several very nice straight flights, his landings being quite good. Lieut. Thompson was also out for straights having Merriam as passenger, and this pupil will now start solo work. Rising wind again caused suspension of flying.

In the afternoon Merriam took Lieut. Rickards for the test flight but found conditions very bad. Several flights made during the course of the afternoon, but found conditions still hopeless. Bendall also out later, but no school work possible.

On Wednesday wind and rain prevailed up to mid-day and no work was possible, but in the afternoon came an improvement and Merriam set out for a test and found conditions perfect. Capt. Powell made several good straights, then up with Merriam for instruction in right-hand turns. Merriam testing another biplane after which Lieut. Empson and Mr. Ewing went on the same machine, each pupil completing a couple of circuits with good banking. Mr. Featherstone then set out to undergo the necessary tests for the certificate

which he successfully passed. The wind was quite gusty but this pupil and Lieut. Todd, who was also successful, both flew in a very steady manner, making good landings.

Merriam out with Lieut. Lee and behind Mr. Lane, the latter now being ready for solo work. After a test, Capt. Powell,



**ALL-BRITISH.**—A snap group at the Bristol School, Lark Hill, Salisbury Plain. From left to right (on the machine): E. Harrison (pilot instructor, Australian), V. P. Taylor (recently passed pilot, Australian), Geoffrey England (pilot instructor, English). Standing: H. Busteed (pilot instructor, Australian), and C. P. Pizey (pilot instructor, the school manager, and Lieut. in the R.F.C.).

Lieut. Empson and Mr. Ewing were all putting up good flights, darkness putting an end to the day's work.

On Saturday morning Lieuts. Empson and Ewing passed for their certificates, the former alighting dead on the mark after each test.

**Ducrocq School.**—Monday last week, J. Alcock testing flying circuits with new Bristol propeller. McAndrew circuits and figure eights; he is now ready for his *brevet*. Alcock circuits again next day in a gusty wind, also out in the evening flying across country in his usual style, and on Wednesday circuits in great style with well-banked turns. McAndrew put in some circuits in a gusty wind.

**Howard-Flanders School.**—Weather very hopeless on Wednesday morning last week, but it suddenly changed at mid-day and resulted in a magnificent afternoon. Raynham out for a quarter of an hour before lunch, and gave a fine exhibition of flying, banking to awesome angles to such an extent that the machine seemed to rise sideways, or side-slip upwards at the turns. Finished by flying down the alley between the Martin-Handasyde and Ducrocq's sheds, a few feet above ground, and jumping easily over the old Deperdussin shed opposite. After lunch took the machine to Farnborough, reaching 4,500 ft. en route. At Farnborough he put the machine through the hours test and the speed test. Average speed 66 m.p.h. Thursday, bad weather prevented all flying.

**Vickers School.**—Monday last week, the wind being rather high for pupil work, Barnwell went out on No. 5 monoplane and was brought down outside the track with a broken petrol pipe. The field in which the landing was made being too small and soft for a restart, the wings were taken off and the machine wheeled back by road. In the afternoon, Capt. Salmon, with Barnwell in the passenger seat, made some excellent straights in the biplane.

Major Cameron and Capt. Salmon each had a long spell Tuesday on the biplane before breakfast, Barnwell behind. They are both doing very well and are ready for solo work. Knight, meanwhile, had out the other biplane for tests, and afterwards went behind Capt. Salmon for a few more straights before breakfast. In the afternoon both biplanes were out, Major Cameron, Capt. Salmon and Mr. Lane piloting.

Wednesday morning was too windy for flying, and in the afternoon *brevet* flights prevented pupil practice. At dusk, Knight made a short flight on one of the biplanes.

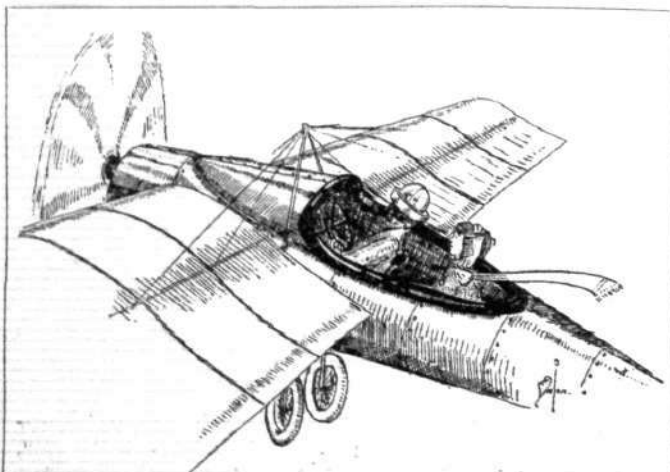
Knight was giving instruction, Thursday morning, to Major Cameron and Capt. Salmon on one of the biplanes in a 15 m.p.h. wind. Wind prevented flying for the rest of the day.

**London Aerodrome, Collindale Avenue, Hendon.**

**Grahame-White School.**—Monday, in the afternoon, Capt. Power doing straights on No. 7 machine with Mr. Louis Noel, later on Mr. R. H. Carr also straights with the same instructor. Next day, Mr. R. H. Carr out on No. 7 machine doing straights with Instructor Manton in the morning. In the afternoon Mr. Power straights with Mr. Noel in a slight wind.

During the week when the weather has been calm, exhibition flying could be seen at the London Aerodrome, Mr. Noel and Mr. Manton taking up passengers. On Monday morning, the 16th, Mr. Sydney Pickles made a fine high altitude flight, reaching a height of over 7,200 ft.

**Blackburn School.**—Monday morning last week Mr. H. Blackburn brought out the school *brevet* machine, which he put through some interesting evolutions by way of testing the air. Afterwards Dr. Christie and Messrs. Glew and Buss spent 25 minutes each in straight flights and half-turns. All three make first-class landings, and reach a good height flying perfectly steadily.



She: (after a prolonged pause) "Mr. Aviator, what would happen if the wind dropped?"

A good morning's work done Tuesday by Messrs. Lawrence Spink, Glew and Buss, after test flight by Mr. Blackburn. In the evening the above named again out for practice of about 25 mins. each, after which Mr. Morris, a newly joined pupil, essayed his first roll, and expressed considerable surprise at the manner in which pylons, sheep and other things animate and inanimate get in the way, still he made a very creditable straight roll before getting off his machine.

Messrs. Glew and Buss straight flights 10 mins. each on Wednesday morning, and in the evening Messrs. Buss, Glew and Lawrence Spink practising straight flights, Mr. Morris rolling, all 10 mins. each. Very windy, Thursday, and no work.

**Bleriot School.**—Windy all day Monday, last week, until late in the afternoon, when M. Gandillon had time to do straight flights until darkness. The following morning Lieut. Loftus Bryan was out on No. 1 taxi and did a nice straight flight at about 20 ft., landing well. M. R. Desoutter then did a straight on L.B. 1, but had to discontinue owing to a wire breaking. M. Gandillon did a very good and even circuit at about 60 ft. on No. 3, landing quite nicely, but schoolwork was then interrupted by the sudden rising of the wind.

On Wednesday, M. R. Desoutter was doing straight flights on No. 1 and Mr. Bertram Williams had his first practical lesson, and despite a somewhat stiff breeze, made an excellent start.

Thursday was windy and no school work was possible.

**Salisbury Plain.**

**Bristol School.**—After the usual trial Lieut. Negrescu on Monday last week successfully passed the tests for the second part of his certificate, in a gusty wind of from 15-20 miles an hour, observed by Prince Cantacuzene and Mr. D. Arthur. England was out giving numerous tuition flights to Lieuts. Bigsworth, Bowhill and Vernon, but the weather was much too bad for further tuition trips, and work was confined to the hangars. Busted took Prince Cantacuzene for a flight on one of the 80-h.p. Bristols, this completing the day's work.

In the afternoon Pizey made a trial and then up with Mr. Tower. Lieuts. Vernon, Marix and Bigsworth, giving Lieut. Vernon a second trip. England was busy taking up Lieuts. Vernon and Marix and Mr. Tower for two flights each, and then up with Lieuts. Vaughan, Bigsworth and Bowhill, all pupils having two trips. Jullerot was out on a biplane giving tuition to Lieuts. Marix, Bigsworth and Bowhill and Mr. Tower, each pupil being taken up twice.

Busted took Prince Cantacuzene for a flight on one of the 80-h.p. Bristols, this completing the day's work.

England was the first out on Tuesday, ascending on the side-by-side monoplane with Lieut. Todd, and then on biplane with Lieut. Bowhill, Lieut. Vernon, Lieut. Vaughan Bigsworth and Mr. Tower, the latter two having second trips. Pizey out on another biplane giving two trips each to Lieut. Bowhill and Marix and one to Lieut. Littleton.

In the afternoon Pizey was again out first, going on a new machine for a test flight, but this was the only ascent, the weather being very unfavourable.

Wednesday was hopeless all day, wind and occasional rain entirely preventing any outdoor work.

No improvement Thursday, and all attention was confined to the machines in the hangars.

**Royal Flying School.**—On Tuesday afternoon of last week Air Mechanic McCudden was out on the Maurice Farman biplane flying in a 30-mile wind for some time at a good height. Capt. Dawes afterwards took over the machine and spent 20 minutes scouting around the downs. On Wednesday, Capt. Dawes was out on the Maurice Farman biplane 214, and after making a circle headed off for Farnborough. During the trip the wind was very changeable, especially in the neighbourhood of Basingstoke, but he arrived at Farnborough in 55 mins.

**South Farnborough.**

**Royal Flying Corps.**—Military Wing.—An additional squadron has now been formed in the Royal Flying Corps: namely, No. 4 Squadron. "A" flight, the machines of which are all Breguet biplanes, has been transferred from No. 2 Squadron to form the nucleus of the new squadron, with Major Raleigh as squadron commander. The Cody machine has also been handed over to No. 4 Squadron. Early in the new year will probably see the departure of a squadron to a new base, and there is every reason to believe that other squadrons will rapidly be formed and distributed to various stations in Great Britain, which will give the general public an opportunity of becoming more closely acquainted with the valuable work of the Royal Flying Corps. No. 2 Squadron, under the command of Major Burke, has done some hard work during the past year, and fully established their claim as a valuable unit to the forces during the late manoeuvres.



*No. 2 Squadron.*—Monday last week was rather gusty and there was practically no flying except for a couple of short trips by Capt. Becke on B.E. 206. Major Burke, however, took the same machine out previous to Capt. Becke, for a short spin.

Tuesday was rather gusty, but was a slight improvement on Monday from a flying point of view. Major Raleigh on the 100-h.p. Breguet 211, took the machine up on several occasions, having to contend with a strong wind. Major Moss, with Capt. Becke, went up on a Maurice Farman biplane 215, for a twenty minutes' flight, and on returning against a very stiff wind, the machine appeared almost stationary in the air for a few minutes. Capt. Becke took several passengers up during the afternoon on the same machine. Richet, one of the Breguet pilots, came over from Hendon on an English Breguet, and was accompanied by P. H. Cooper, his mechanic, for the purpose of demonstrating the capabilities of this particular type of machine.

The flight from Hendon occupied 55 mins. against a strong head wind all the way. Their average altitude was about 3,000 ft. This machine, by the way, is fitted with a 110-h.p. Canton-Unné engine which is mounted in a horizontal plane in the front of the fuselage, and drives a four-bladed propeller of 10 ft. diameter through a two to one bevel gear. The arrival, later in the afternoon, of Verrier from Hendon on a Maurice Farman caused considerable interest, as also did his fine performances round the aerodrome on the common during the late afternoon. A strong wind was still prevailing, from 20 to 30 miles an hour, and Verrier's handling of the Maurice Farman under these conditions was well worth witnessing. Gordon Bell also gave a fine display on the Short tractor, and put the machine through some very good tests against the strong wind.

Wednesday opened with clear weather, but the wind was still rather high during the afternoon. Major Raleigh was out on Breguet 211. Capt. Fox with Lieut. Joubert de la Forte went on B.E. 201 for a flight of 20 mins.' duration. Richet was out again on the 110-h.p. British-built Breguet, demonstrating the speed qualities and climbing powers of this particular type; Lieut. Playfair accompanied him. During the afternoon a Flanders monoplane was sighted at about 4,000 odd ft., and was a sight well worth watching. The pilot had presumably brought the machine from Brooklands, and after many inquiries it was stated to be Raynham who was responsible for the exhibition. After sighting No. 2 Squadron's sheds he continued to treat the on-lookers to some fine manoeuvres over the Farnborough Common. Capt. Fox made a fine flight from Lark Hill on Maurice Farman 214. Long distance cross-country trips are becoming quite an ordinary occurrence in the Flying Corps. This shows the enthusiasm of the officers for their exciting work, especially when one takes into consideration the kind of weather which usually prevails during late autumn and early winter, and the past few weeks has seen machines taken out and flown splendidly, in weather which a year ago would have meant an idle time for the machines as far as flying is concerned. An instance of how little the weather interferes with the work of the Royal Flying Corps occurred on Thursday. During the morning in a driving rain and strong wind, Lieut.

Herbert made a fine flight round the aerodrome, as also did Capt. Pigott on the same machine, Maurice Farman 215. Major Rayleigh also went out on the Breguet 213 under the same trying conditions. By dinner time the force of the wind had increased to such an extent that flying was practically out of the question, as the wind speed was anything from 25 to 35 miles an hour, and very gusty at that.

#### Upavon (Central Flying School).

THE week opened with rather stormy weather, it being dull and inclined to rain. The men at the Central Flying School are being given a fortnight's furlough during the Christmas holidays. This means that very little flying will take place during the next week or so.

Monday, December 16th.—A moderate northerly wind prevailed and the sky was overcast and dull. Lieut. Allen on the Maurice Farman 415 made a couple of good flights of 14 mins. and 25 mins. respectively. Lieut. Pepper followed with a couple of flights of similar duration. The machine was then handed over to Lieut. Atkinson, who was away for about 8 mins., followed by Major Ashmore, who made three very good flights, which occupied the greater part of an hour actually in the air. Engineer Lieut. Randall, R.N., afterwards went for a trip of 25 mins. on the same machine. Major Ashmore then went up on the Maurice Farman 418 and made a fine flight of about half an hour. Lieut. Atkinson followed with a flight of the same duration, and Lieut. Allen was out on the same machine about a quarter of an hour. The Short biplane 401 was piloted by Major Gerrard, with Capt. Lithgow, R.A.M.C., as passenger, for about 15 mins. Major Gerrard afterwards went for a short trip on 402 Short biplane. Tuesday, December 17th was sunny, with a moderate south-west wind. Lieut. Longmore, R.N., was out on the Maurice Farman, 411, accompanied by Leading Seaman Bateman, who will, no doubt, shortly try for his pilot's certificate. Lieut. Longmore then took up Paymaster Lidderdale for a short trip. On the Maurice Farman 415, Lieut. Allen, Lieut. Pepper, and Colonel Cooke each made a flight of about 10 mins. duration. Major Gerrard took Chief-Mechanic Scott out for a short spin on the Short biplane 402.

Wednesday, December 18th, saw a change of the weather—for the worse, unfortunately. A strong north-west wind, accompanied at intervals by rain, was blowing all day. The Maurice Farman 415 went out, piloted by Lieut. Atkinson, and was up for about 20 mins. Lieut. Pepper was also out for about the same length of time. Petty Officer Andrews then ventured out, and made a good 15-min. flight in bumpy wind. Engineer Lieut. Randall, R.N., then took the same machine out for over half an hour in a stiff wind, doing a fine performance. Major Gerrard on the Short biplane 402 made a couple of short trips, with Seaman Brady, after which Brady was up alone for a few minutes. Major Gerrard afterwards took Capt. Lithgow out on the same machine for about twenty minutes. Lieut. Longmore, R.N., on the Maurice Farman 403 took Leading Seaman Bateman out for 10 mins. Major Ashmore did a fine flight lasting half an hour on the same machine. Lieut. Longmore also went out on the Maurice Farman 411 with Paymaster Lidderdale for about 20 mins., afterwards taking up Air Mechanic McNamara for about 12 mins.



### ROYAL FLYING CORPS.

IN our issue of October 19th last, we published particulars of the Royal Flying Corps, taken from the Army List. The Naval Wing, however, was not included, but we now give below this section of the R.F.C. as set forth in the Army List for this month:—

#### NAVAL WING.

(Parent Ship: H.M.S. "Acteon." Capt. C. D. Johnson, M.V.O., R.N.)

#### Aeroplane Section.

*Officer Commanding*—Commander C. R. Samson, R.N. (acting).  
*Squadron Commander*—Lieut. R. Gregory, R.N.

#### Flying Officers—

Lieut. J. W. Seddon, R.N.  
Lieut. W. Parke, R.N.  
Lieut. C. J. L'Estrange-Malone, R.N.  
Capt. R. Gordon, R.M.  
Sub.-Lieut. F. E. T. Hewlett, R.N.

#### For Machinery and Overseeing Duties—

Eng.-Lieut. E. F. Briggs, R.N.  
Artif.-Eng. F. W. Scarff, R.N.

#### Medical Officer—Staff-Surg. H. V. Wells, R.N.

#### Under Instruction—

Lieut. C. L. Courtney, R.N.  
Paymaster E. R. Berne, R.N.



Sub.-Lieut. R. L. G. Marix, R.N.V.R. (acting).  
Sub.-Lieut. H. A. Littleton, R.N.V.R. (acting).  
Boatswain H. C. Bobbett, R.N.

*For Repair Work*—Carpenter J. V. Collins, R.N.

#### Airship Section.

*Officer Commanding*—Commander E. A. D. Masterman, R.N.

*Squadron Commander*—Lieut. N. F. Osborne, R.N.

*Undergoing Airship Course at Farnborough*—

Lieut. P. A. Shepherd, R.N.  
Capt. C. E. Risk, R.M.  
Lieut. G. V. Willman-Lushington, R.M.A.  
Lieut. J. T. Courtney, R.M.

\* Borne in "President."

*For Wireless Telegraphy Duties with Aircrafts*—Lieut. R. Fitzmaurice, R.N.



### ROYAL FLYING CORPS.

THE following appointments were announced by the Admiralty on the 18th inst.:

Commander O. Schwann, to the "President," additional, as Assistant to Director of Air Department, to date November 25th.

Lieut. C. J. L'Estrange-Malone, to the Admiralty, as Assistant Director of Air Department, to date November 25th.

Engineer-Lieut. G. W. S. Aldwell, to the Admiralty, as Engineer Inspector in Air Department, to date November 25th.

# FOREIGN AVIATION NEWS.

## Legagneux After Height Record.

THERE is one person at least who is not altogether satisfied at the height record made by Garros, and that is Legagneux who, as soon as the Aero Club of France issue their verdict as to the height attained by Garros, will make another attempt to regain the honour.

## Guillaux Rejoins French Army.

HAVING obtained his superior pilot's certificate, Guillaux has now rejoined the French Army as a flying officer. On the 17th he had to attend an examination at Versailles, and flew over on his Clement-Bayard monoplane. In the course of the return trip he passed over Paris at a thousand metres.

## Tests with Blériot Canard.

ON the 17th inst. Col. Bouttieux paid a visit to Buc and made a trip with Perreyon on the new Blériot Canard monoplane. He also had another flight on the following day and then expressed his satisfaction at the way the plane behaved in the air. The machine, which has a 80-h.p. Gnome motor is said to have a speed of 120 k.p.h.

## Miss Davies Takes Delivery of New Blériot.

AMONG the visitors to Buc on the 18th inst. was Miss Trehawke Davies, and she enjoyed a trip with Perreyon on her new Blériot monoplane, of which she has just taken delivery. Later she was up again on the machine, this time with Mr. J. Valentine as the pilot.

## Testing Farman Machines at Buc.

ON the 18th inst., quite a number of military biplanes were tested at the Farman Schools before being officially delivered. Before a French Military Commission, Maurice Farman, Gaubert, Bernard, and Fourny tested several machines for the French Army, Fourny taking one with a load of 250 kilogs. for a flight of over an hour's duration. Another was delivered to representatives of the Italian Army.

## The Sommer School at Rheims.

WITH either the Sommer monoplane or the biplane Tetard seems equally at home, and he has lately been doing quite a lot of flying at Mourmelon on a biplane fitted with one of the new 80-h.p. De Dion aviation engines. On the 18th inst. Bathiat flew from Mourmelon to Ste. Menchould and back, landing at Chalons Camp and at Rheims.

## Buc to Verdun in 2½ Hours.

DIRECTED to take a Maurice-Farman biplane to Verdun the Marquis de Larcinty-Tholoan started from Buc on the morning of the 18th inst. and arrived at his destination after a trip of 2 hours 25 minutes. He found the wind very troublesome at Chalons and Angonne.

## Rheims to Vincennes on a Farman.

AFTER having been down at Chalons and Rheims for the purpose of demonstrating the latest little Henry Farman biplane, Chevillard returned on the 18th inst., to Paris. Starting from Rheims he quickly went up to a height of 1,200 metres, and although the wind made his task by no means an easy one, he arrived safely at Vincennes.

## The German National Fund.

WHEN the National Fund for the help of military aviation in

Germany was closed on the 19th inst., the total amount received was 7,000,000 marks (about £350,000). Of this sum about 400,000 marks were received from Berlin.

## Military Flying in Germany.

WITH the intention of calling at the more important fortified places in the centre and west of Germany, Lieut. Hiddessen and Behm started from Doeberitz on a biplane on the 6th inst. They reached Brunswick, 180 kiloms. away, and stopped there for the rest of the day. The next morning they set out for Osnabruck and got there safely after a trip of 170 kiloms. On the 10th inst. they were to have gone to Bremen, but after covering 30 kiloms. had to descend at Alfhausen, from whence they were ordered to return to headquarters.

## Flying Boats for U.S. Army and Navy.

BOTH the American army and navy now possess latest examples of the Curtiss flying boat. That for the army has been sent to San Diego for use at the winter camp, while the naval one will be used in Cuba during the winter. In its official trials the military machine, carrying a load of 600 lbs. climbed 1,600 feet in less than a quarter of an hour. In another test it climbed 1,200 ft. in 6½ mins., and in the speed tests the average worked out to 54·8 miles an hour.

## The American Army Going Ahead.

AT last the United States Army appears to be tackling military aviation seriously, and plans are under way for the employment of nearly fifty machines, including hydro-aeroplanes before the end of next year. It is proposed to start five training schools, one on the Atlantic Coast, one on the Pacific Coast, one on the Great Lakes, one on the Gulf Coast and one at some central position, as well as many auxiliary centres as can possibly be organised.

It is also proposed to organise three aviation squadrons, i.e., one for each division of the Field Army and one for the headquarters, while the equivalent of eight squadrons will be distributed over fourteen Coast Defence Stations. For service outside the country the organisation will embrace

two squadrons for the Philippines, one for Hawaii and one for Panama. Aeroplane squadrons are also to be organised for the Militia.

## Military Aviation for Brazil.

THE Brazilian Parliament is now considering a measure which seeks to create a school of military aviation and will enable the Government to obtain the services of two expert aviators and to buy three airships, two aeroplanes, six hydro-aeroplanes, as well as guns to be used against aircraft. It is also proposed to offer a prize for an automatic stability device.

## Chili Wants Some Too.

NOT to be outdone by her neighbour, Chili is also seeking to organise a flying Corps. The Chief of the General Staff has prepared plans for a military flying school, and is trying to get the Government to spend £140,000 in buying airships and aeroplanes and laying out a proper aerodrome.

## Flight "Man-Birds."—XI.

—From the original by Frank M. Williamson.



## THE REED WARBLER.



# TESTING A 100-H.P. MONOPLANE.

A REMINISCENCE.

By SIDNEY V. SIPPE.

*Il est quatre heures, Monsieur, et il n'y a pas de vent.*

There was a tired night porter bending over me. I turned over sleepily, and gradually roused myself. "Four o'clock, is it?" and then it suddenly dawned across my sleepy brain that I must be up and doing, for way out at the Aerodrome de la Champagne was a new type of monoplane that I had to go and test that morning. Although so early, the sun was already beginning to make itself felt, which was perhaps as well, for the previous night had been so stifling that my friends and I had taken our mattresses and bed trappings out on to the balcony and had turned in there. Dressing did not take long, and within a few minutes we were a merry and thoroughly awake party, settled more or less comfortably in a car that had been sent down from the aerodrome to carry us there. With the exception of ourselves and a party of revellers from a café opposite, who were making a noisy departure after carrying their celebrations so far into the morning, no one was astir. We sped through the deserted cobbled streets of the town as rapidly as possible, considering the nature of their surface. We were impatient to get to the aerodrome, and had no eyes to appreciate the beautiful gardens and well laid-out flower-beds that we passed. Striking the Neufchâtel road, a quarter of an hour brought us to the flying ground, by which time the sun, intent on providing another stifling day, had almost cleared the atmosphere.

This was the celebrated Rheims aerodrome, stretching away perfectly flat in all directions as far as the eye could reach. Dotted here and there one could discern the several pylons that marked out the 10-kilom. course, over which the Gordon-Bennett Eliminating Trials were to be run. Away to the left, about a mile and a half distant, was a battery of 40 hangars, owned and used exclusively by one well-known monoplane firm. Here, I thought, was activity with a vengeance. In England, forty sheds are as many as we get in an average aerodrome, occupied, perhaps, by twenty or more different firms or individuals. Our interest was centred around one of our line of hangars, whose shutters were being rapidly taken down by four mechanics. They ran out two machines, the big 100-h.p. passenger-carrier that I was destined to test, and a miniature racing monoplane. There was something like father and son about the two machines, so alike were they, but so different in size. Although there was little to do to my machine, since all preparations had been made and fuel tanks filled overnight, the mechanics were bustling around in a typically vigorous fashion. It is a peculiarity of French mechanics that, even if there is little or nothing to be done, they seem bent on making a brave exhibition of excited activity. And this is infinitely more noticeable when the designer, the business manager, or the works' manager happens to be near. It was so in this case, for the man whose clever brain had evolved the machine was here, there, and everywhere, pulling at the cables, examining fastenings, drumming the fabric, and thoroughly examining everything. Personally I had no preparations to make, except to have a glance round the machine, tread into my overalls, put on a helmet, and get my goggles ready.

My feelings were rather difficult to analyse, and I stood there waiting for the machine to be pronounced ready, badgered the while by well meaning, but fearfully annoying friends, who kept up a running fire of advice as to how

best to contend with the peculiarities of a powerful high-speed monoplane, and more especially what to be prepared for when turning to the right with such a high-powered rotary motor. None of them appeared to me as if they had ever flown a yard, let alone a machine of that power. My feelings were very similar to those I had experienced in my school-days when waiting outside the schoolroom to be admitted in five minutes' time to undertake the answering of a dozen or so unknown questions. It was not nervousness—it was a vague feeling of wonder as to what would happen.

The machine now stood ready, and I clambered up, and got comfortably installed in the spacious cockpit. The arrangement of the controls was exactly the same as on the lower horse-powered monoplanes of the same type that I had previously flown. There only remained to waggle the lever and the rudder-bar to see that the warping, rudders, and the elevator were working properly. In front one of the mechanics was priming up the engine with petrol. Two of his fellows were lying full length under the fuselage, gripping the wheels, two more were hanging on to the wing tips, and the rest of them were clinging to the tail. "Contact," said he in front, and I switched on. He gave the propeller a lusty swing. The motor spluttered and got into its stride. Fourteen cylinders spitting fire, oil and smoke and emitting a deep rhythmic roar, for all the world like a low Bourdon organ note. It is infinitely more pleasing to the ear than the staccato of the 50-h.p. Gnome. The oil is coming through and pulsating in the gauges; I try the petrol-tap and the switch and find them working properly, so I wave to the mechanics to release their hold. Frankly, I must admit to being rather paralysed at the speed with which the big monoplane bounded away over the ground. Very gingerly I pulled the lever back, and sat there holding on tight and waiting for something dreadful to happen. A few seconds passed—to me they seemed an eternity. Nothing terrible had happened so far—perhaps nothing terrible would happen. My muscles subconsciously relaxed, and I settled down to think things out quietly. Here I was, sitting in a big machine, rushing through space at nearly 80 miles an hour in a relative wind which



Sidney V. Sippe.

threatened, so it seemed, to blow my head clean off my shoulders. There was nothing to do, and gradually it dawned upon me that this was quite the simplest machine I had ever flown. The sense of security was remarkable, indeed. I was perfectly convinced by this time that nothing dreadful could possibly happen. I might have been sitting in a Dreadnought, so steadily and solidly did the machine force its way through the air. I began to look around. The ground was about a thousand feet below, and the machine was still rising, although the inclinometer showed that the machine must have been doing so on a perfectly even keel. Another curious point was that the engine seemed somehow not to be pulling. The revolution indicator, however, showed that it was doing, if anything, a trifle over its normal 1,200 revolutions a minute. It was the evenness and smoothness of the turning of these fourteen cylinders that gave rise to this delusion. Surely about time I turned; so putting the nose of the machine down a few degrees, I pushed the rudder-bar over to the left. The big monoplane banked slightly, and the ground below, sheds, bushes, hedges, and everything, revolved through 180°. I was now heading for the sheds, feeling perfectly comfortable, and enjoying myself immensely. Now that they were directly below me, and, forgetting all that my friends had told me about the terrors of a right hand turn with

a big engine, I pushed my right foot forward, and swung round. Not until I was right round did I realise that I had accomplished a supposedly difficult manœuvre. I straightened the machine out to get a clear run down to the ground in front of the sheds, and putting the elevator slightly forward, cut off the petrol. Immediately there was silence, except for the gentle hum from the propeller and wing cables as I planed down. The machine touched ground, ran along, rapidly losing speed, bumped twice, and stood still. Almost before I had time to look round the machine was surrounded by a crowd of mechanics, all firing off questions in rapidly spoken French. I had little or no idea what they were talking about, but my stock phrase, "*Ca marche bien*," seemed to please them well enough. In fact, we were all very pleased; the designer because another of his machines had proved eminently successful, the mechanics because they had followed the machine right through the works from crude steel and wood, and myself because I had done what little I had done.

Just outside the aerodrome there is a little inn named, appropriately enough, "*Le Progres de l'Aviation*." Anyone passing might have remarked a noisy group of oily-looking individuals sitting around one of the tables outside. Nothing short of "fizz" that morning!

## FROM THE FOUR WINDS.

### Lost in the Sky.

THERE is something pathetic and prophetic in an unfinished manuscript found in the desk of the late Miss Harriet Quimby, the aviatrix who fell to her death at the Boston meet last July. Miss Quimby had prepared the data for an article for *Leslie's*, relating her experiences while lost in her monoplane during flights in Mexico, Garden City and at other places. She had written the opening pages of the story. They are the last words she left for her readers in *Leslie's*, to whom she sent her helpful messages every week. As they have a singular interest in connection with her sad and untimely death, we print them herewith. The simple caption on the article, as written by her, was the one word, "Lost!" How

soon was fate to find its fulfilment! The unfinished manuscript reads as follows:—

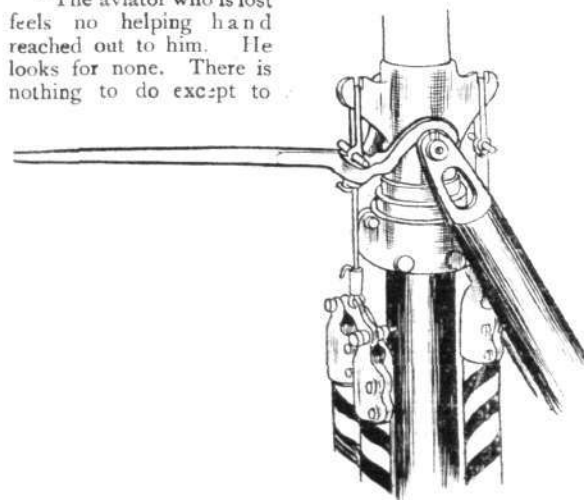
### LOST!

"Nobody likes to be lost. There is a wretchedness about it most pathetic. Our hearts go out to the lost child, we join in the search for the missing, whether we be strangers or neighbours. The instinct to go to the rescue is always the same.

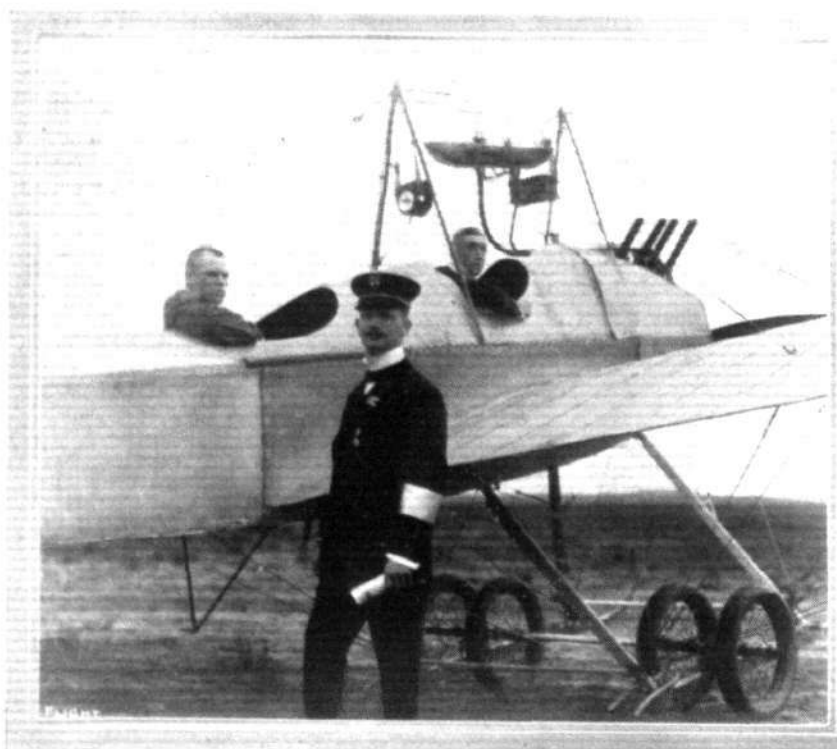
"It is a new experience to be lost in the sky, but it is as real and trying as to be lost in the midst of earth's wilderness or on the infinite expanse of the waters of the sea. I speak with knowledge. Twice I have been lost in the sky while driving a monoplane.

"The sense of loneliness and helplessness one feels while driving a thousand feet above the earth in a swiftly moving monoplane, with nothing but the everlasting sky above and the horizon around and with no sign of recognition from the distant earth below, is overwhelming and indescribable. One can do nothing but look and hope. One must drive on, amid the roar of the motor blade making its thousand revolutions a minute.

"The aviator who is lost feels no helping hand reached out to him. He looks for none. There is nothing to do except to



A detail of the Blériot military monoplane, showing the means whereby, using a special lever, the shock-absorbers can be disconnected, allowing the machine to be lowered on to its knees, as it were.



Lieut. Krieger and Lieut. Friedensburg on their Harlan military-type monoplane, which was awarded first prize in the recent contest for flying round Berlin.



keep an eye keenly on the watch for some friendly spire, some sign of a well remembered meadow or spread of water, indicating the location of the aviation field to which a safe descent can be made. But it is never hopeless, for the aviator knows that if darkness supervenes, it will, in all probability, disclose the beacon fires of watchers on the field. If one has not flown too far away, he can easily recognize, from his commanding place of vantage, the blazing pile where the watchers wait.

"Why should anyone be lost in the air? It is the easiest thing in the world. The landmarks you see, as you walk or ride on the surface of the earth, are not recognized as such by the flyer. On the earth you see these things straight ahead, or at the side, within the horizontal range of the eye. From a balloon or an aeroplane you see them from the standpoint of the perpendicular. You see the roof, not the sides of a house; the pinnacles that pierce the sky, not the majestic towers that command the vision from a side view.

"Recall your own experience and your exclamations of surprise after you have gone to the top of the Washington monument at the national capital, the arch d'Triumphe in Paris, the top of Bunker Hill at Boston, or of a skyscraper in any city. You find yourself puzzled as to the points of the compass. The most familiar buildings, streets and avenues are almost indistinguishable except as you study the vista spread before you.

"Is it a wonder that one gets lost in the sky? Remember that from the dizzy height of a monoplane as one looks over the side of the car, the earth seems flattened out, the rivers shrink until they become no larger than brooks, the hills are levelled and fields of variegated colour appear like spaces on a checkerboard. The earth is flat, not round, as the aeroplaneist sees it. But I could always pick my landing at any time when I was lost, for I kept sailing about until I found a suitable place. Then I came down and was happy!"

The closing sentence of this last unfinished manuscript of Miss Quimby recalls a sealed message she left for her parents before she went to Boston to make her last flight. In that message, which carried with it a sad premonition, she said that if ill-fortune should befall her, she would meet her fate "rejoicing."

Surely this brave girl, the first in the United States to secure a pilot's licence to fly, deserves a fitting memorial. We are glad to say that contributions to her Monument Fund are still being received by us. They will all be acknowledged in due time.—*Leslie's Weekly*.

#### German Airships and Foreign Orders.

Berlin, December 18th.

A section of the German public still professes to be indignant at the prospect of a Parseval airship being sold to England, but the agitation against the sale seems to be somewhat forced. In view, however, of the number of letters of protest addressed to it, the *Vossische Zeitung* applied directly to Major von Parseval, and has received the following statement from the company which constructs Parseval airships: "Our company will never sell an airship to a foreign country unless it is sure of the acquiescence of the Imperial Government, and fortunately the latter has a different standpoint from that assumed by some of our newspapers. Our Imperial Government takes the perfectly correct view that our private airship industry must be dependent on orders from abroad as long as our defensive forces cannot keep it employed to an extent that is remunerative. In the case of Count Zeppelin the matter is different in so far that he administers the National Fund, and is thus under a moral obligation to place his products at the disposal only of the German defensive forces. Members of our company, as you know, placed £50,000 at the disposal of a motor-airship experimental company, *à fonds perdu*, in order to enable the non-rigid system to be developed to its present perfection. When this sum was exhausted no further capital *à fonds perdu* was forthcoming, but, on the other hand, practically the same persons were ready to invest capital in a new company, the *Luftfahrzeuggesellschaft*, in order to make the construction of airships a paying business. This is the only means by which we shall be enabled to proceed with the construction of non-rigid airships. Every new airship that we build, whether for Germany or for a foreign country, increases our experience and furnishes us with fresh funds, and our defensive force is thus indirectly benefited by orders from abroad. The names of the members of our company are a sufficient guarantee that we shall never act in opposition to the intentions of the Imperial Government."

In a leading article on the subject, the *Vossische Zeitung* quotes the opinion given by Bismarck in reply to protests against the sale of German war material to foreign countries. The great Chancellor said it was evident that it was not necessary for foreigners to buy such material in order to learn the secrets of its construction. As it was impossible to keep such matters secret, he considered that manufacturers who could not be kept fully occupied by home orders

were perfectly justified in selling abroad. "Take orders," he said, "wherever you can get them." Bismarck is further reported to have said: "Provide for the maintenance of your factories and make as much money as you can out of the Russians and the French." The Radical organ considers that the Parseval Airship Construction Company is in a similar situation, and that Bismarck's advice can be well applied to it.—*Morning Post*, December 19th.

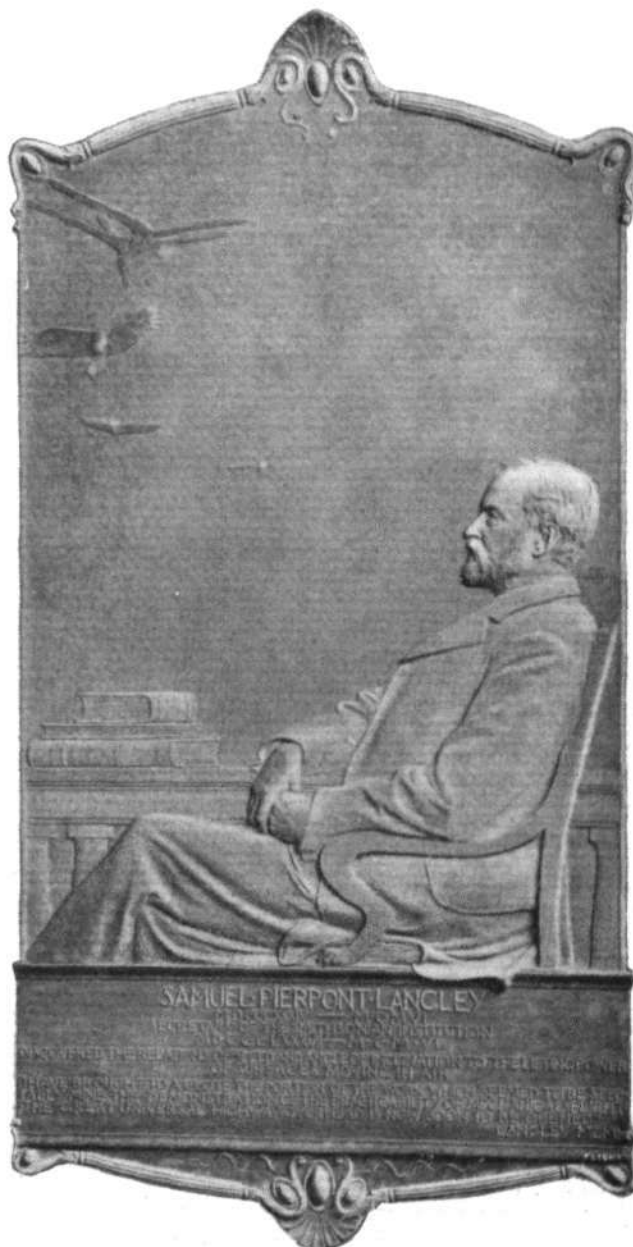


#### Aircraft History at South Kensington.

On Monday last there was opened in one of the galleries of the Science Museum a most interesting collection illustrating the history of aeronautics, as well as the research side of the science, and all who can, should make an effort to inspect the exhibits. These include full-sized machines and models of aeroplanes and dirigibles, as well as a large number of instruments of various kinds, while at one end of the gallery is a Meteorological Station. The collection remains on view until the end of January.

#### A Lengthy Balloon Trip.

COMPETING for the City of Paris prize, M. Rene Rumpelmayer, accompanied by Mdme. Goldsmith, left St. Cloud on the evening of the 14th inst. Travelling in a westerly direction they passed over Luxemburg and Bohemia and eventually landed at Bogozslo in Solecia, a distance of 1,200 kiloms. from Paris. They were received by the military, who were a little suspicious of their aerial visitors and did some damage to the balloon with their bayonets.



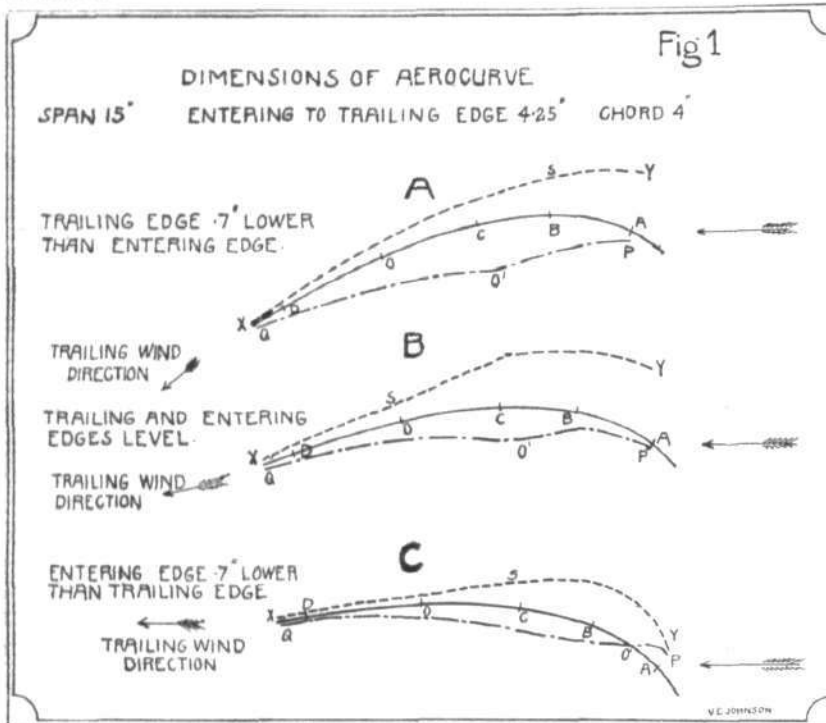
The Langley memorial tablet which has been executed by John Flannagan, of New York City.

# Models

Edited by V. E. JOHNSON, M.A.

## Wind Pressure on Aero-curve Surfaces.

DESIRING to obtain some information with respect to the wind pressure on the windward and lee side of an aero-curve, and being unable to obtain any published information either in English or French\* text books save the well-known classical experiments on plane surfaces at impossible angles of flight, the writer had recourse some time ago to the one and only method left, viz., that of personal experiment.



The results obtained are shown graphically in Fig. 1—A, B and C.

The curves do not show the pressures in any especial unit, but regarding a vertical section at any point as representing some particular unit, the rest of the curve gives a correct proportionate representation in that same unit.

The experiments were made with great care—three different kinds of manometers were used—an open tube connected by flexible tubing with a thread of coloured alcohol in a U-shaped tube; in another case, a modified form of Pitot tube in conjunction with a more sensitive gauge, and in the third case a tube similar but somewhat larger than the first, over which a very thin membrane was stretched, connected with a drop of alcohol in a fine horizontal tube, the movements in the latter case being very small. Suitable optical means were provided for observing them on an enlarged scale. In every case the tube mouth or membrane was quite flush with the aero-curve surface. This adjustment had to be made with considerable care, as the smallest error gave rise to marked discrepancies. No devices, such as a cheese cloth, &c., were employed to render the wind other than turbulent in this sense, but the velocity was kept fairly constant. The respective pressures on the underside of the aero-curve at the points A, B, C, O, D were compared relative to one another, all the various combinations, A with B, A with C, B with C, &c., being tested. The same was done with respect to the respective pressures on the top of the plane. Then the top, or, as it is usually termed, negative pressure at A, was compared with the positive pressure at a portion of the aero-curve, slightly on one side of A, but having the same position as A in so far as the leading and trailing edge are concerned. The same was done at B, C, O and D. Other combinations were also tried.

The Fig. 1 A, B, C summarises all these results.

The positive pressure gave no trouble at all, the results agreeing fairly closely—nor did the negative in so far as the rear half of the

\* The above experiments were made prior to the publication of Eiffel's experiments.

aero-curve was concerned—but with respect to that portion contained between the entering edge and middle considerable difficulty was experienced. The camber of the aero-curve was purposely made somewhat excessive. The graphs show quite clearly the more efficient part of the aero-curve so far as the lift is concerned.

It will be noticed that even in the case of 1 C there still exists considerable lift, although the trailing wind is now horizontal.† The direction of the trailing wind was ascertained by means of smoke blown over the aero-curve, by lycopodium powder scattered on the same and then blown off, and by fine threads of unspun silk. In 1 B it will be noticed the trailing wind is slightly inclined upward compared with the tangent to the trailing edge. The following experiments were made with respect to what is known as the cyclic up-current. In Fig. 2, if A be the scale pan of a small and fairly sensitive balance with parallel motion so that B C must move vertically up and down, on placing a piece of light cardboard or paper on A, slightly larger than it and on balancing it carefully—and on blowing above or along the top of it (not on it) using a piece of cardboard C D as a screen (but not allowing it to touch A) so that all the "blow" shall pass along or above the cardboard it was found the scale pan at once rose, showing apparently diminished atmospheric pressure on the top of A. This is not, however, the correct explanation as can be shown as follows:

In Fig. 3, let A B be a sectional or side-view of the cardboard A. The air streams by the plane A B along the lines of O P, but when passing A the front edge of the plane, owing to viscosity‡ (the kinematic viscosity of air is 14 times that of water) drags some of the air from e along with it (and from c as well, but we are not concerned with that), and we have what is known as a cyclic up current at A, tending to lift the first part of the plane. If the plane A be a piece of paper, it will, if strongly blown across, finally lift up in front, be caught in the air current and blown away. Experiments with smoke fully confirmed this. If, instead of shielding the plane we have it inclined—if only at a very small angle to the horizon, this cyclic up current is still formed even with the air blowing along both sides. Obviously the same holds with respect to an aero-curve, with a dipping front edge in order that it may meet the relative upward trend of the wind with minimum of shock. Fine threads of unspun silk attached to the underneath surface of the aero-curves shown in Fig. 1 A, B, C clearly proved its existence. In some experiments made with considerably less camber than the one illustrated, the negative pressure was proportionately less, but in every curve or plane experimented with it was always found to exist.

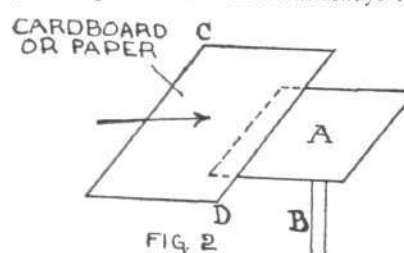


FIG. 2

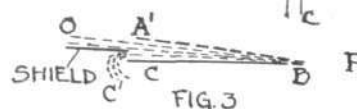


FIG. 3

This does not mean that anything in the nature of a partial vacuum exists on the upper side of an aero-curve—as so many still appear to think—which *per se* assists the lift. The average pressure of the air is some 2,116 lbs. per square foot, and the maximum lifting effect of an aero-curve not more than 5 lbs. per square foot.§ Divide 2,116 by 5, and we have 423. The greatest vacuity that could possibly be produced would be less than one-quarter of one per cent.

† There is, of course, still a downward acceleration of the air with respect to the flight path.

‡ Viscosity may be defined as the adhesiveness of the fluid molecules to one another, so that resistance is thereby offered to deformation.

§ Since the above was first written there have, it is true, been cases where this is exceeded.



An aeroplane lifts by accelerating downwards a certain mass of air, and it is the function of an aerocurve to do this in the simplest possible manner, *i.e.*, with the least disturbance and with the minimum propulsive power. According to this view if we take the aerocurve illustrated in Fig. 1 A, B, C, and instead of using a single surface employ a double one, forming these surfaces with due regard to the pressure curves there shown, we should expect that such a surface would show an increased lift. Because now our air stream follows far more closely (it can never do so *exactly*) the two surfaces, and we have a final combined downward acceleration, the resultant of the two, and therefore of increased magnitude. The double correctly-shaped thick plane will lift more than the single plane alone, but is it more efficient? Considered in terms of propeller thrust, certainly not; but in practice, our aerocurves' surfaces must have rigidity and strength; in other words, they must be thick. By experiment then, or by mathematical analysis (which in itself must be founded on data culled from experiment), we must find exactly where and in what manner our aerocurves can be thickened (*i.e.*, strengthened) without reducing their efficiency.

The foregoing experiments, although conducted only on a small scale, when pushed to a logical conclusion, do give us a form of aerocurve in approximate agreement with those in actual practice; and the experiments have at least this merit—that they are perfectly genuine ones—and were not made with the idea of being fitted into any particular niche either of theory or practice—but solely for the purpose of gaining information. They were essentially experiments made on a model scale—their actual cost some fifteen shillings, and I publish the same with a view to encourage others to undertake similar kinds of experiments. The actual time taken in making them was about a fortnight. The motive power used to provide the necessary air draught was an ordinary foot lathe fitted with a very heavy fly-wheel.

#### Discing. By G. V. UPWARD.

I HAVE during the last three years been making some experiments with discs, the result of which may be of some interest to your readers. The discs cost practically nothing and afford endless scope for experiment and amusement.

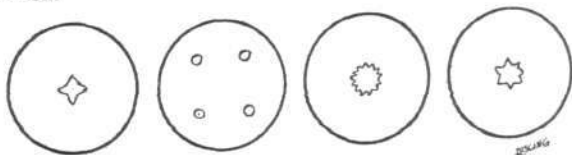
First get a piece of tin and cut it in circular form. I find the most useful size to have a circumference of about 21 ins., diameter about 6 $\frac{3}{4}$  ins.

On a calm day a light disc is desirable, not more than from 1 $\frac{1}{2}$  ozs. to 1 $\frac{3}{4}$  ozs. in weight. For moderate winds 2 ozs. weight should be used, and in strong winds 2 $\frac{1}{2}$  ozs. should be the weight of the disc.

On a calm day take a light disc, camber it slightly, being careful to keep the hollow surface skywards. Then with the right hand well back on the left side of the body launch the disc with considerable force. For 50 yards it should mount gradually, then when the force of the throw is spent it will turn over and glide beautifully for a distance of from 100 to 150 yards further.

If the camber is too great the disc will come to the ground with two somersaults at a distance of about 80 yards. If the camber is insufficient the disc will turn over at about 70 yards distant and fall edgeways, burying itself in the ground.

In a strong wind, a heavier disc is necessary. Against the wind there should be very little, if any, camber, and as a rule it is advisable to throw low. I have thrown 100 yards with the disc at no time more than a foot above the ground. In moderate winds, stability will often be obtained by cutting holes of various designs in the centre of the disc. I have got good results from the designs illustrated.



With these, and other types, I have had flights of 300 yards. If the throws are made on a gentle down-slope, flights of great distance will be secured, and the discs, with a favourable wind to aid them, will rise to extraordinary heights.

The beauty of witnessing a disc sailing like a bird with steady flight high in the buoyant air is a joy to behold, and the grace with which it sweeps earthwards with long *vol plané* is a sight as exhilarating as the descent of the most skilful aviator.

As a game, discing is worthy of attention. With a half-dozen discs of various weights and designs in one's pocket, one is able to compete with fellow discers over any arranged course. Flights can be made over hedges, ditches, roads, anywhere where the undergrowth is not too thick to hide the disc when it falls.

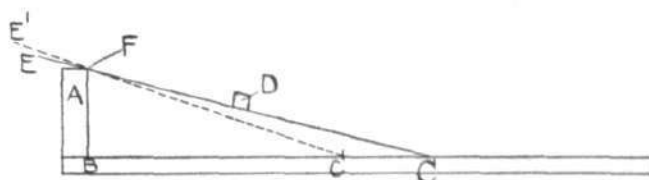
A course, say of five miles across country is agreed upon, the winner covering the distance in the least number of flights.

As a sport this is surely equal to the best; great skill being required not only in selecting the right disc for the right occasion but also in negotiating corners, and soaring above hedges, trees and other obstacles that happen to be in the course.

I can commend discing with confidence to your readers as a fascinating sport and one from which the aeromodelist may quite possibly cull new ideas.

#### A Practical Determination of the Coefficient of Friction between Rubber Surfaces with Various Lubricants.

Mr. N. F. H. Clarke sends us the following interesting communication *re* the above. The value of soft soap as a lubricant is very clearly shown.



BC is a base board graduated in centimetres.

AB is a block fixed at right angles to BC and 9.8 centimetres high.

EC is a smooth rubber surfaced board resting on A and C, also graduated in centimetres.

D is a weight also rubber surfaced.

To use the apparatus D is placed on EC, and then EC is moved up or down as at E'C' as required until D just begins to slide. Now the coefficient of friction is given by the tangent of the angle of inclination of the surfaces to the horizontal.

Therefore  $\frac{AB}{FC}$  gives the required coefficient for  $\frac{AB}{FC}$  = the tangent of the angle FCB. This experiment is repeated several times with the rubber coated with various lubricants.

Below is a table giving some results:—

Lubricants.	Coefficient.	Remarks.
1 None ... ..	9.8 = .72	
2 Water ... ..	13.5 = .72	
3 5 per cent. soda water ...	13.5 = .72	In all these cases there appeared to be a sucker-like action between the surfaces.
4 10 per cent. soda water...	9.8 = .69	
5 20 per cent. soda water...	14.3 = .68	
6 Saturated soda water ...	14.4 = .66	
7 5 per cent. soap solution	14.2 = .66	
8 10 per cent. soap solution	9.8 = .32	All these solutions gave better results when hot.
9 20 per cent. soap solution	30.5 = .25	
10 Saturated soap solution...	38.0 = .23	
11 Soft soap... ..	41.5 = .20	
12 Soft soap and black lead	47.5 = .19	
13 Black lead ... ..	51.7 = .53	A rather sticky mixture.
14 French chalk ... ..	18.5 = .28	
15 80 per cent. soft soap solution ... ..	24.5 = .37	
	26.4 = .06	
	51.5	

The pressure between the two surfaces was constant throughout, and was 13.1 grammes per square centimetre.

#### Replies in Brief.

T. C. BELLAIRS.—Dunne, June 18th and 25th, 1910; Deperdussin, February 17th, 1912, September 7th, 1912, August 19th, 1911. The model hydro-aeroplane you refer to is no longer in existence, and neither photograph nor drawings of it were ever taken. If you try this type use one long chief central float and two small balancers. The other is extremely difficult to deal with in model form.

E. STIER.—You must fit a rudder.

## MODEL CLUB DIARY AND REPORTS.

CLUB reports of chief work done will be published monthly for the future. Secretaries' reports, to be included, must reach the Editor on the last Monday in each month.

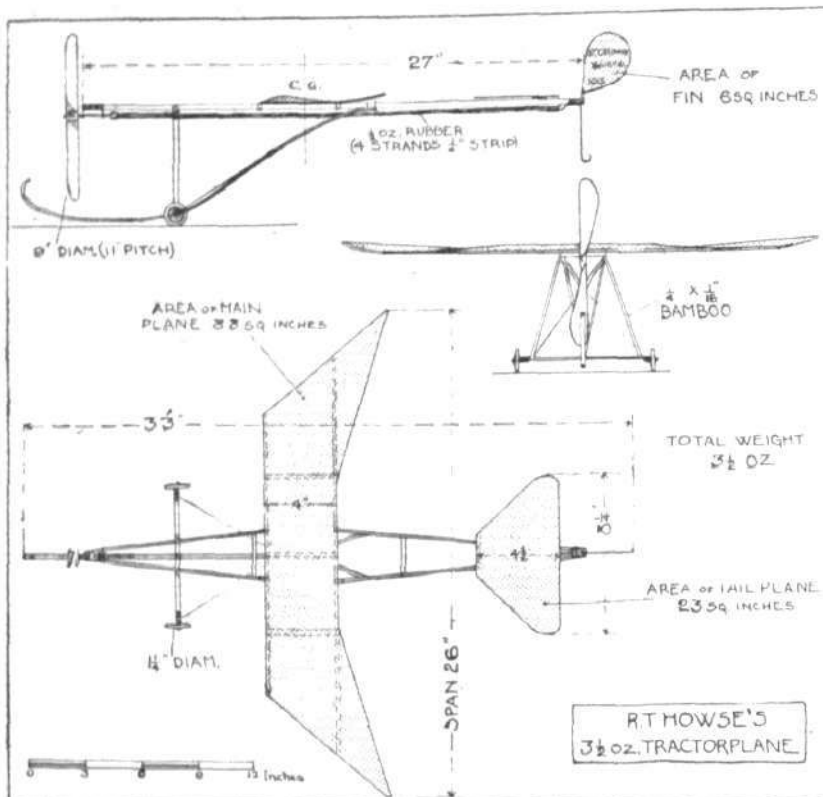
### Birmingham Aero Club (8, FREDERICK ROAD, EDGBASTON).

*Monthly Report.*—The past month has been very quiet as regards model flying, more attention being given to the finishing of the full-sized glider. This has taken longer than was anticipated owing to the weather, most of the work

machines and models, at St. Andrew's Hall, Ealing Road, Wembley, 5 minutes' walk from Wembley L.N.W. Station. Paddington and Sudbury trams pass end of road. Commence 7.30. Admission 6d. If you come you will not be disappointed.

### Reigate, Redhill and District (8, BRIGHTON ROAD, REDHILL).

*Monthly Report.*—All members very busy on machines for the "Rawson Cup," given by the president. W. H. Norton, J. L. Sutton, J. W. Burghope, W. Key and M. Wilson, tuning up 8-oz. r.o.g.'s in wicked weather several times. Norton testing three tractors, one a biplane. Sutton frequently testing many 1-1-P2 machines, as also Burghope. Nieuport (38-oz.) of latter out several



### R. T. HOWSE'S 3 1/2-OZ. TRACTOR-PLANE.

The fuselage, which is 27 ins. long, consists of two members of spruce,  $\frac{1}{4}$  in. by  $\frac{3}{16}$  in. at centre, tapered to  $\frac{1}{8}$  in. by  $\frac{3}{16}$  in. at ends, and two stream-lined distance pieces.

The landing chassis is of bamboo,  $\frac{1}{4}$  in. by  $\frac{1}{8}$  in., and is made up with a central skid turned up in front to protect the tractor-screw, four struts, and the axle. The wheels are  $1\frac{1}{4}$  ins. diameter (taken off a toy motor car), and are mounted on steel shafts lashed to the axle.

The main plane is 26 ins. span and 4 ins. chord at centre, and is made of bamboo covered with varnished Jap silk. It is cambered  $\frac{1}{8}$  in. at the centre, and diminishes towards the tips, which are brought back and given a slight negative angle as in the Weiss gliders.

The tail has a span and chord of  $8\frac{1}{4}$  ins. and  $4\frac{1}{2}$  ins. respectively, and is made of 20 s.w.g. piano wire.

The fin, also of 20 s.w.g. wire, has an area of 6 sq. ins.

The motive power is four strands of  $\frac{1}{8}$  in. strip rubber, 24 ins. long ( $\frac{1}{2}$  oz.), which drives a 9-in. tractor-screw of 11 ins. pitch.

being done in the open. However, by the time these notes are in print the machine should be erected on the club ground. The committee have been busy during the last few weeks, discussing the programme for next year, which includes proposals, which, if carried through successfully will lift the club above the level from which it started as a model club. Full particulars of membership, &c., can be obtained from the secretary, also of the annual general meeting to be held in January.

### Bristol and West of England (Model Section) (3, ROYAL YORK CRESCENT, CLIFTON).

*Monthly Report.*—The first public hydro-aeroplane meeting of this section was held at the Zoological Gardens, Clifton, on November 30th. Members of the Bristol Model Yacht Club attended with an excellent display of yachts, which were, however, handicapped by an unusually moderate wind. The "motor" boat provided by the authorities had a decidedly busy time. The best flights off the water were made by Mr. Smallcombe's twin-screw tail-first machine, which rose off the water in 5 to 20 ft. (the best flights being made after a slow rise) and flew circuits of the lake, covering 100 yards or so at a good height. Mr. Howse's machine which was of the same type, but fitted with two rear instead of two forward floats, skimmed the surface but failed to rise. Mr. Howse's tractor model of which photographs, taken at this meeting by Mr. K. Wall, and scale drawings appear in this issue, made a number of excellent high flights rising from the ground and climbing in a truly amazing way considering its original design and low power.

### Ecclesall and District (247, SPRINGVALE ROAD, SHEFFIELD).

MEMBERS please note.—Should weather conditions have prevented the "Aerial Derby" being flown on Boxing Day, December 26th, the arrangements will hold for January 1st.

### Hendon Model Aero Club (20, AUDLEY ROAD, W. HENDON).

BOXING DAY.—Large meeting. Competitions for all classes of models. Flying as usual. R.o.g. tests.

*Monthly Report.*—During past month excellent work has been done in the more scientific branch of model aviation of r.o.g. machines, the following members having built models: Doidge (1-1-P2), Lawrence (0-P2-1-1), Hills (0-P2-1-1), Mitchell (0-P-1-1), Short (0-P-1-1). Few flights have been made owing to adverse weather conditions, but those few who did attempt flights have no cause for grumbling. Hedges has finished his steam engine, which works well under compressed air. Short is working on a  $\frac{1}{4}$ -h.p. petrol engine for model biplane. A new member, R. Holden, has been enrolled, but so far has done no flying. A challenge has been sent to the Hampstead M.Ae.C., but so far no reply has been received. Lawrence has fitted floats to his 0-P2-1-1 machine, but so far has had no opportunities of testing it. The Welsh Harp, where K. and M.A.A. contests of hydro-models are held, is only five minutes' walk from club flying ground. Members will all be sorry to hear of the resignation of the secretary, J. Doidge. F. Short is now secretary, so please note change of address.

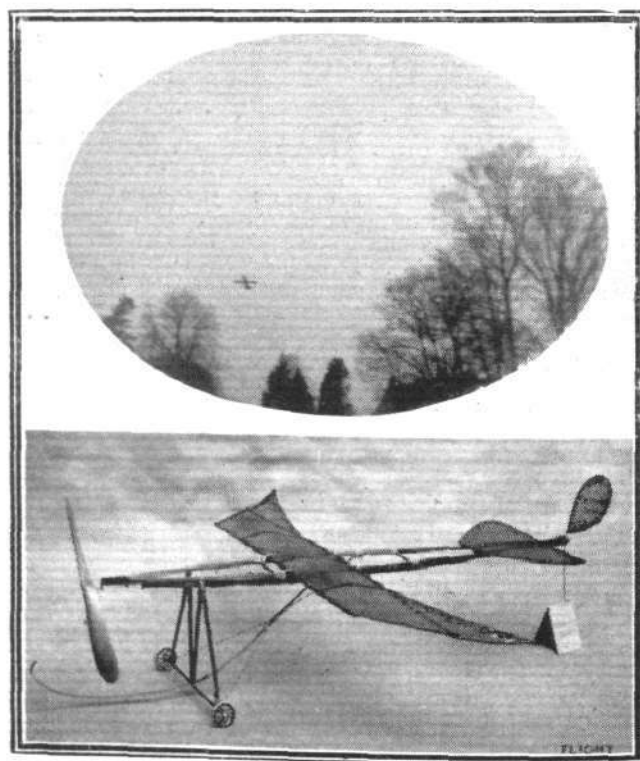
### Leytonstone and District Aero Club, 64, LEYSPRING ROAD.

DECEMBER 28th and 29th, flying as usual, near Brickfields and Bushwood Avenues.

### Paddington and Districts (77, SWINDERBY ROAD, WEMBLEY).

DECEMBER 28th, to-day (Saturday), Mr. Johnson's lecture, profusely illustrated with lantern slides and models, on "Hydro-aeroplanes," full-sized

times, going strong. Club is to have a stand at Olympia. J. L. Sutton out with hydros, also J. W. Burghope. An extraordinary number of models are now ready for next summer's exhibitions, for club was greatly in demand during the past season, and will be thoroughly prepared for many engagements next season.



Bristol and West of England Aero Club (Model Section).—Mr. R. T. House's tractor Weiss model. Above, it is flying at the Zoological Gardens, Clifton, November 30th.



**Scottish Ae.S. ("ROCHELLE," LIMESIDE AVENUE, RUTHERGLEN).**

JANUARY 14th, demonstration flying (hydro, &c.), at Maxwell Park; 11th, hydro-aeroplane competition at Alexandra Park; 18th, monthly competition at Paisley; 25th, hydro-aeroplane demonstration at Maxwell Park.

*Monthly Report.*—On Saturday, November 30th, the members visited Maxwell Park and gave a demonstration of model flying, large numbers of skaters leaving the ice to see the flights. The r.o.g. competition, advertised for December 7th, was declared off owing to the inclemency of the weather. On Saturday, 14th inst., some of the members visited Maxwell Park for the purpose of testing hydro-models, even allowing for the boisterous weather, Mr. Gordon made a large number of very successful flights, but Mr. Graham's model was not successful, owing to the float base not being wide enough. During the month the members have been very busy in the workshop, but the weather has prevented the practical tests which we are all keenly looking forward to. Several new members have been enrolled during this period, but an increase in enrolments is urgently desired. The benefits offered are the use of a splendid workshop, at 18, Holland Street, which is fitted with all necessary tools required in model making, including a Drummond lathe, and we are preparing a series of practical lectures, to commence in January. Due announcement will be made of the subjects. The membership fee is: seniors, 7s. 6d.; juniors, 4s., and the secretary will be pleased to welcome any intending members at workshop on Tuesday, Thursday, and Saturday evenings.

*Scottish Records.*

Hand-launched ...	Distance...	J. S. Gordon ...	2,006 ft.
	Duration...	Jas. Myles ...	65 secs.
Off-ground ...	Distance...	Wm. Craig Boyd ...	739 ft.
	Duration...	Wm. Craig Boyd ...	33½ secs.
Hydro, off water ...	Duration...	C. F. Arthur ...	21½ "
Tractor: hand-launched ...	Duration...	J. S. Gordon ...	16½ "
" off ground ...	Duration...	J. S. Gordon ...	10½ "

**Sheffield Model Aero Club (35, PENRHYN ROAD, SHEFFIELD).**

*Monthly Report.*—The Colver Cup competition on November and proved to be one of the most exciting contests ever held by the above club. At the start, and until about five minutes before time, Mr. J. P. Worrall was leading. Mr. G. H. Dewsnap proved to be the winner with a fine flight of

178 yds. 2 ft. 7 ins. Mr. J. P. Worrall being second with 138 yds. 2 ft. Although the weather was exceedingly cold and windy, some extraordinary flights were accomplished. Mr. W. H. Bagshaw and Mr. C. F. W. Cudworth officiated as judges. November 11th, Mr. E. W. Colver presented the following prizes:—Mr. G. H. Dewsnap "Colver Cup" and silver medal; Master C. E. Worrall, the youngest member of the club, bronze medal for the best duration flight for month, 37 secs.; Mr. J. P. Worrall best added duration flights, total entrance fees received for month. November 28th, V. E. Johnson, M.A., gave an interesting lecture on hydro-aeroplanes, at St. Paul's Schools, chairman, Mr. E. W. Colver.

**S. Eastern Model Ae.C. (1, RAILWAY APPROACH, BROCKLEY).**

DECEMBER 28th, 29th, usual flying experiments at Kidbrooke, Blackheath, Woolwich Common, Chislehurst and South Norwood.

**Windsor Model Aero Club (10, ALMA ROAD, WINDSOR).**

*Monthly Report.*—During the past month little model flying has been done, this being partly due to the bad weather, and partly to the fact that the glider has occupied all our spare time. Very satisfactory progress has been made, five of the members having had towed flights. The glider is a biplane, Chanute type, 32 ft. span, chord, 4 ft., with monoplane tail, 10 ft. by 2 ft., and weighs, complete, only 66 lbs. It was constructed entirely by members, and taking into consideration the fate of most gliders, has lasted some time. It is now being re-wired, in anticipation of some fine sport on Boxing Day, when it is proposed to take it to a hill some way from the town. Hitherto the nature of our flying ground has precluded any possibility of free gliding, and it is hoped that on this occasion to achieve success in this direction. Our nearest approach to an accident was due to the bars supporting the pilot—in this case, E. A. Dowsett—coming unfastened, and dropping him to the ground practically unhurt. The club are exhibiting at Olympia, and it is hoped that a good set of models will be shown. Gliding will take place each windy Saturday.

**Yorkshire Ae.C. (Model Sec.) (53, WEST STREET, LEEDS).**

DECEMBER 28th.—Poppy Fields, Beeston.

*Monthly Report.*—Very fine flights have been done by Whitaker and Hodgson with single tractor, doing 20 and 25 secs. duration. Holmes, Mabb, and Midwood, with usual twin-screw machines, also Pease, with single screw, doing long flights. Whitaker and Holmes also out with rise-off-ground models.

## CORRESPONDENCE.

\*. The name and address of the writer (not necessarily for publication) MUST in all cases accompany letters intended for insertion, or containing queries.

**Automatic versus Inherent Stability.**

[1695] It is very gratifying that you are permitting extended discussion of automatic and inherent stability, and that you have, yourself, taken part therein.

Among other editorial comments in FLIGHT of September 14th last, you write:—"It is to be hoped that our correspondents who are conducting among themselves this correspondence on automatic versus inherent stability, are in thorough accord as to what they mean by 'stability' in air." And, later, you observe: "It is for the pioneer to set the pace in some new direction, and we say in all sincerity, may good luck go with him." You are, in effect, with an expression of good feeling for the pioneer, asking for an agreed definition of absolute stability in air. But up to the present this has not been formulated.

The definition about to be suggested may be described as possessing no authority, as arbitrary, and unduly exacting, but it may either be justified or attract more light, and so will serve:—

An aeroplane possessed of absolute stability in air is that which will preserve its balance and stability in all atmospheric conditions.

This definition indicates a high ideal, and it need scarcely be said that experience proves that the present type machine, splendid as it is, and bravely flown, falls short of it. But to what extent? And can it be improved so as to completely satisfy the formula?

Of atmospheric conditions, dangerous to the balance and stability of the aeroplane during flight, the chief are gusts and winds of high velocity, these latter varying in this country, as recorded by the Meteorological Office on the Beaufort scale, from 8° to about 10°; No. 8 indicating a wind of 42 miles per hour; No. 9, 50 miles; and No. 10, 59 miles, with a pressure of 10.5 lbs. per square foot; 59 miles per hour being exceeded rarely.

Is the present type aeroplane able to be flown in winds of such speeds? The answer is a qualified affirmative. Were there always a steady travel of these winds, a machine with a speed of 60 miles per hour would have an advantage over all of them, and already an aeroplane has registered 105½ miles per hour with an engine of 140 h.p. But as in winds of these velocities there are brief periods of slower speeds, with gusts at irregular intervals, the flight in them of a present type aeroplane, even of 105½ miles per hour, and with a highly capable pilot, is likely to be both arduous and dangerous. We know that after flight in a wind of 45 miles per hour, it was reported that a machine with a speed of 70 miles per hour, when subjected to gusts, "warped itself" with such violence as to wrench the controls from the pilot's hands. It may safely be inferred that worse might easily happen to an aeroplane of this speed in a gusty wind of 59 miles per hour. Exposed to such a wind, the machine would certainly not of itself preserve its balance, and the strain upon the pilot in maintaining stability would be too severe for long endurance.

This physical incapacity of the pilot limits present type dimensions, for if it be dangerous to fly such a machine of the weight of 1 ton

in a 45-mile wind, it would be practically impossible to fly a similar aeroplane of 3 tons weight in a wind of 59 miles.

The consideration is particularly important in respect of the hydro-aeroplane, which it is desirable should be of a useful passenger-carrying capacity, and able to be flown to a predetermined time-table. But, unless in calms, with the methods and mechanisms of the present type, the pilot could not control the larger machine, and it is certain that it could not of itself maintain stability.

The question finally arises: How shall the machine be endowed so as to enable it to preserve its balance and stability in all atmospheric conditions? This directs attention to natural or inherent stability, and automatic stability, as possibly offering the solution.

"Natural stability," applied to the aeroplane, appears a term difficult of defence. Stability is of the nature of the bird, the prototype of the aeroplane. But if there be stability in the present type aeroplane, a structure formed of "art and man's device," it would appear to be inherent stability obtained by artificial means.

"Inherent stability" is claimed to be secured by a particular formation and disposition of the wing surfaces. Presumably these arrangements enable the machine to offer such passive resistance to adverse conditions as enables it to maintain its balance and stability. It may be that within a certain range of adverse circumstances this passive resistance may suffice, but calculations which may not be justified indicate it to be uncertain that this range would be wide enough to entitle the machine to be described as possessed of absolute stability in air.

"Automatic stability" remains to be considered. According to some critics, even if this be possible, it can only be obtained by devices extraneous to the known aeroplane system. The efficiency of these devices is too often assumed, and in any case they are condemned as adding weight, complexity, and cost to the machine. But it is to be remembered that the addition of the internal combustion engine to the glider gave us the aeroplane itself, an automaton in respect of motion. If by the addition of some efficient device the aeroplane may be made an automaton in respect of balance, the increased security must be worth the added weight, complexity, and cost.

But automatic stability may be obtained without extraneous devices. The present type aeroplane, by an amendment of its construction, may be made self-acting mechanically so as to produce such active resistance to adverse conditions as shall entitle it to be considered possessed of "absolute stability in air." Equivalently, by a quality inherent in the amended construction, automatic stability, conferring absolute stability in air, may be made possible.

In order to ascertain how the construction may be amended so that its inherent quality may endow the machine with automatic stability, and, incidentally, facilitate the pilot's control, it is necessary to investigate the imperfect construction which produces the present inherent instability. Consider the rigid fixture of the wings to the body which contains by far the greater weight of the

system, and the effect of this rigid construction upon the lateral control. Should a vertical gust strike the extremity of a wing so that it be driven downward, overcoming the inertia of the body to which it is attached, with ensuing complete displacement of pressure from beneath the wings, the unbalanced mass falls sideways; the weight of the engine right ahead converts the side fall into a head-long dive, and the entire rigid structure tumbles to disaster.

Were the wings so mounted that when struck by a vertical gust at either extremity they might have rotative motion, in a lateral sense, about the body, this disturbance of their balance would leave the balance of the body, the great mass of the machine, laterally unaffected, and the pilot, through his balancing planes, would more easily control the lateral balance of the minor mass of the system contained in the wings than the lateral balance of the whole mass of the machine. But this does not confer absolute security, because the ready manipulation of the balancing planes would still depend upon the vigilance of the pilot, and he may not always be alert.

But if the balancing planes were mechanically connected to the body, this, the main mass of the machine, laterally free of the wings, and stabilised in its normal position by its inertia and connection with the balancing planes, would enable the wings when struck at either extremity by a gust which impelled them to rotative motion about the body to operate the balancing planes instantly, and oppose them to the 33 lbs. per square foot pressure of the hundred and five-mile current created by the forward motion of the swift machine. This would effectively check the impulse to rotative motion, that is the tendency to loss of the lateral balance of the wings which contain the minor weight of the aeroplane, while the lateral balance of the body containing the major weight of the system would remain undisturbed.

Thus stability, laterally, may be automatically obtained. But it is necessary, in order that absolute stability in air may be secured, that automatic stability, in a longitudinal sense, shall also be made effective.

In considering the methods by which fore and aft stability may be automatically achieved, it would appear that the extended distribution of the main masses of the machine, and their rigid fixture to the body-shell, prevent the absolute efficiency of the present longitudinal control. The engine, the chief mass, is usually fixed at the forward extremity, necessitating disposition of balancing masses unduly to the rear of the centre of pressure, this extended distribution of the masses tending to greater danger from their moment of inertia on displacement of the normal attitude than need be incurred. Concentration of the masses at the transverse axis reduces this danger, but will not eliminate it if the masses be rigidly fixed in this position ; for should a gust displace the pressure from beneath the wings, the aeroplane, wings, body, and the masses contained therein, the whole forming an entirely rigid structure longitudinally, will fall in the abnormal attitude to which it is impelled, and will require space wherein to recover balance. But as there may not always be sufficiency of space, it is vital that means should be devised to prevent at its beginning any impulse to an abnormal attitude of the machine.

If the concentrated masses, instead of being rigidly fixed to the body-shell be so mounted that the wings and body-shell when struck by a gust may rotate longitudinally about them without being able to disturb their normal attitude, the danger from the moment of inertia of these masses, the major weight of the system would be eliminated, and the pilot would only have to prevent the assumption of an abnormal attitude of the wings and body-shell, the minor weight of the machine. But this does not make for absolute immunity from danger. The longitudinal balance of the main masses of the system has been placed beyond attack; but there is still dependence upon the pilot for the maintenance, through his control of the elevator, of the normal attitude of the wings and body-shell, and a sudden assault may defeat his vigilance.

But if the pilot's control of the elevator were connected to the concentrated masses, these, stabilised in their normal position by their inertia, method of mounting, and connections with the elevator and driving-gear, would enable the wings and body-shell when struck by a gust causing them to attempt rotation about the masses, to actuate the pilot's control, and bring the elevator into operation to receive the high-pressure of the machine-created current. This would, in the fraction of a second, check automatically the attempted rotation of the wings and body-shell, that is, their impulse to abnormal attitude, while the normal attitude of the masses containing the major weight of the aeroplane would remain immune. Thus stability longitudinally may be automatically effected.

These suggested arrangements also would enable the pilot to exchange the automatic and hand-controls instantly, either one for the other.

It has been shown that an aeroplane may maintain its balance and stability, both laterally and longitudinally, in gusty winds of high velocity, these being the chief of conditions dangerous to flight. Therefore it should maintain balance and stability in conditions of

lesser danger, and so be entitled to be described as "an aeroplane possessed of absolute stability in air," thus justifying the definition suggested at the beginning.

The judges in the Military Aeroplane Competition remark in their report:—"The flyer's objection to wind appears to be based chiefly upon the fatigue induced by keeping uninterruptedly on the alert. In a flight of a duration as long as three hours, the element of fatigue is an important consideration; improvements in design or mechanism may, however, overcome this difficulty, and allow of prolonged flights in winds of high velocity." From this it would appear that the judges believe that a machine may be constructed endowed with automatic stability.

Mr. Ovington, in his last letter (1650) says:—"I still claim that it is the men who have not flown who want automatic stability." But this is against evidence. General David Henderson and Major Sykes, two of the judges in the Military Aeroplane Competition, responsible for the expression of opinion in favour of automatic stability, which has been quoted, have won their flying *brevets*—Mr. Glenn Curtiss in America, M. Moreau in France—both flyers employ automatic stability devices, and, in England, Mr. S. F. Cody, who also has flown, is of the number of the advocates of this method of obtaining balance and stability. The fact is of exceptional significance in the case of Mr. Cody. In him we have an accomplished pilot, and a constructor of proved eminence, who in the competition referred to, which was open to the world, won the chief prize for a machine made, of the most part, with his own hands. Yet within a few days of this achievement he states that he is desirous of promoting a company to enable him to produce a machine endowed with automatic stability, thus virtually declaring his prize-winning aeroplane to fall short of a practical flyer's ideal.

The judges and the chief prize winner in the Military Aeroplane Competition are seen to acknowledge the desirability of this vital principle. The fact should be impressed upon those responsible for the construction of aeroplanes for our Naval and Military services, and incline them to experiment with any suggested method for obtaining automatic stability which offers a fair prospect of success.

Neither fact nor reason appeal to the prejudiced, but the evidence now in existence must cause the honest doubter in authority to revise his judgment, because upon his action in this matter the lives of many gallant men may possibly depend.

Haywards Heath.

L. BEAUCLERC GOLDMAN.

Unique Christmas Presents.

MANY and varied are the presents which are purchased at this time of the year, but the gifts received by two ladies resident at west London must surely be unique. Their Yuletide presents took the form of tickets for passenger flights at Hendon on Boxing Day or at any other time they pleased, and the recipients look forward keenly to their aerial experience, not a bad example to follow.

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